



MINISTRY OF TRANSPORTS AND INFRASTRUCTURE  
ROMANIAN RAILWAY AUTHORITY - AFER

ROMANIAN RAILWAY INVESTIGATING BODY



## INVESTIGATING REPORT

Of the railway accident happened on the 12<sup>th</sup> of October 2012 between the railway stations Praid and Sovata, in the branch of the Regional Centre for Railway Operation, Maintenance and Repairs Braşov



*Final Report*

## Notice

In the case of the railway accident happened on the 12<sup>th</sup> of October 2012 at 00:20 o'clock, in the branch of the Regional Centre for Railway Operation, Maintenance and Repairs Braşov, traffic section Blaj - Praid (nonelectrified single line), noninteroperable section managed by SC RC CF TRANS SRL Braşov, between the railway stations Praid and Sovata, consisting in the derailment of the wagons no. 338767359288 and no. 315559724853 (the ninth and tenth from the head of the train) from the composition of the freight train no. 99962 (the ninth and tenth from the head of the train) that belonging to the railway undertaking SC RAIL FORCE SRL Braşov, Romanian Railway Investigating Body performed an investigation according to the provisions of the Government Decision no. 117/2010. Through the performed investigation, the information concerning the occurrence of this accident were gathered and analyzed, the conditions were established and the causes determined.

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

Bucharest, 17<sup>th</sup> of January 2013

**Approved by**  
**Director,**  
Nicolae SANDU

*I ascertain the compliance with the  
legal provisions concerning the investigation  
and the drawing up of this investigating report that*

**I submit for approval**  
**Chief investigator**  
**Eugen ISPAS**

***This notice is part of the Report for the investigation of the railway accident happened on the 12<sup>th</sup> of October 2012 at 00:20 o'clock in the branch of the Regional Centre for Railway Operation, Maintenance and Repairs Braşov, traffic section Blaj – Praid (nonelectrified single line), noninteroperable section managed by SC RC CF TRANS SRL Braşov, between the railway stations Praid and Sovata, consisting in the derailment of the wagons no. 338767359288 and no. 315559724853 (the ninth and tenth from the head of the train) from the composition of the freight train no. 99962 (the ninth and tenth from the head of the train).***

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## **I. PREAMBLE**

### **I.1. Introduction**

In the case of the railway accident happened on the 12<sup>th</sup> of October 2012 at 00:20 o'clock, in the branch of the Regional Centre for Railway Operation, Maintenance and Repairs Braşov, traffic section Blaj - Praid (nonelectrified single line), noninteroperable section managed by SC RC CF TRANS SRL Braşov, between the railway stations Praid and Sovata, consisting in the derailment of the wagons no. 338767359288 and no. 315559724853 (the ninth and tenth from the head of the train) from the composition of the freight train no. 99962 (the ninth and tenth from the head of the train) that belonging to the railway undertaking SC RAIL FORCE SRL Braşov, Romanian Railway Investigating Body performed an investigation according to the provisions of the Government Decision no. 117/2010. Through the performed investigation, the information concerning the occurrence of this accident were gathered and analyzed, the conditions were established and the causes determined.

The investigation of Romanian Railway Investigating Body did not aim to establish the guilty or the responsibility in this case, it's purpose being to improve the railway safety and to prevent the railway accidents and incidents.

### **I.2. Investigation process**

According to the provisions of the article 48, paragraph 1 of the Regulation for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and subway safety, approved by the Government Decision no. 117/2010, on the 12<sup>th</sup> of Octobre 2012, Romanian Railway Investigating Body opened an investigation regarding the accident occurred in the branch of the Regional Centre for Railway Operation, Maintenance and Repairs Braşov, traffic section Blaj - Praid (nonelectrified single line), noninteroperable section managed by SC RC CF TRANS SRL Braşov, between the railway stations Praid and Sovata, consisting in the derailment of the wagons no. 338767359288 and no. 315559724853 (the ninth and tenth from the head of the train) from the composition of the freight train no. 99962 (the ninth and tenth from the head of the train) that belonging to the railway undertaking SC RAIL FORCE SRL Braşov.

Taking into account that the occurred facts are clasified as a railway accident according to the article 3 point 1 of the Law no. 55/2006 concerning the railway safety and this accident has relevance for the railway system according to the article 19, paragraph (2) of the Law no. 55/2006 in conjunction with the article 48, paragraph 1 of the Regulation for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and subway safety, approved by the Government Decision no. 117/2010, OIFR director decided to start an investigation and to appoint an investigation commission consisting in:

- Sever PAUL - investigator - Romanian Railway Investigating Body- main investigator
- Laurian CERNAT - territorial inspector - Railway Safety Inspectorate Braşov - membre
- Mihai MORUŞCA - territorial inspector - Railway Safety Inspectorate Braşov - membre

## **A. ACCIDENT DESCRIPTION**

### **A.1. Short description**

On the 12<sup>th</sup> of October 2012, at 00:20 o'clock, in the branch of the Regional Centre for Railway Operation, Maintenance and Repairs Braşov, traffic section Blaj - Praid (nonelectrified single line), between the railway stations Praid and Sovata, one occurred the derailment of the wagons no. 338767359288 and no. 315559724853, the both being derailed by first bogie in the running direction, at around 20 cm from the head of rail. The freight train no. 99962 belongs to the railway

undertaking SC RAIL FORCE SRL Braşov and the derailed wagons being the ninth and tenth from the head of train.

The freight train no. 99962 ran in the on the relation Praid – Stamora Moraviţa. On the distance Praid – Târnăveni Vest the freight train no. 99962 supposed to be hauled by the railway undertaking SC RAIL FORCE SRL Braşov, having in composition the hauling locomotive DHC 881 and 11 wagons charged with salt.

The locomotive and the train's staff belonging to the railway undertaking SC RAIL FORCE SRL Braşov.

Were not fatalities or injuries.

## **A.2. Accident causes**

### **A.2.1. Direct cause, contributing factors.**

**The accident's direct cause** was the value of the gauge that exceeded the maximum value allowed by the prescriptions of the Instruction of norms and tolerances for construction and maintenance of the lines with normal gauge no. 314/1989 (chapter 1, article 1 – item 13).

Contributing factors:

- the inappropriate condition of the sleepers that permitted the increasing of the gauge over the allowed value in operation;
- the inappropriate condition of the wagon no. 33876735928-8 that had a characteristic failure at the axle no.1 (the distance between the outer faces of the flange of wheels was under the minimum limit that is allowed by the provisions of the article 221(2), item (a) from the Regulation of Railway Technical Operation no. 002/2001.

### **A.2.2. Underlying causes.**

- the track maintenance works and inspections were not properly performed;
- were not checked the main conditions that must to comply the pairs of wheels at the hauled railway vehicles for being allowed to ran on railway infrastructures lines;

### **A.2.3. Root causes.**

Were not.

## **A.3. Severity level**

According to the provisions of the article 7, paragraph (1), item b of Regulation for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and subway safety, approved by the Government Decision no. 117/2010, the event fits as railway accident.

## **A.4. Safety recommendations**

Were not safety recommendations.

The investigating report will be transmitted to Romanian Railway Safety Authority, to the manager of the noninteroperable railway infrastructure SC RC CF TRANS SRL Braşov, to the railway undertakings SC RAIL FORCE SRL Braşov and SC TRANSFEROVIAR GRUP SA Cluj-Napoca.

### B.1. Accident description

The train staff belonged to the railway undertaking SC RAIL FORCE SRL Braşov.

The train's no. 99962 technical inspection and the full brake test were performed by authorized staff that belonged to the railway undertaking SC RAIL FORCE SRL Braşov în Hm Praid.



The train running from the railway station Hm Praid to the accident site was without technical or railway safety problems.

At the stabling in the railway station Sovata, at the main line 2, km 106+692, in an area where is a curve with left deflection (in the train running direction), occurred the falling of the left wheel from the first axle of the wagon's no. 338767359288 first bogie (the ninth wagon from the head of the train) between the strecht of the rails, the right wheel running normal – photo no. 1.





*foto nr. 1* – traces of running and fall of the wheel from left part

After the fall of the wheel from left part (in the train running direction), between the stretch of the rails, the wagon ran in derailed condition, the left wheel running with the bearing surface on the vertical screws and with the lateral part of the tyre rubbing the active side of the track on a distance of 15m.

In the right of the first joint (in the train running direction), the left wheel of the wagon's first axle hit the upper shoulder of the fish plate from the track's inside. - *Photo no. 2.*



*photo no. 2* – the fish plate hitted and destroyed by the wheel from the left part



In all this time, the right wheel of the first axle (in the train running direction), ran normally until to the point in which the wheel from left part hit the upper shoulder of the fish plate. In that moment, the wheel from the right part climbed the rail towards the curve outside and fall on the head of the outside vertical screws. - (photo no.3)



*photo no. 3 – the first vertical bolt hit by the wheel from right part*

After the climbing and fall of the wheel from the right part inside the track, the first bogie ran in derailed condition until to the train stop (a distance of about 60 m).

After the train stop one found out that the first bogie in the wagon's no. 315559724853 running direction (the tenth from the head of the train) was derailed, the wheels from the left part being fell between the stretch of the rails and the wheels from the right part outside the curve.

## **B.2. Accident circumstances**

### **B.2.1. Involved parties**

The railway accident occurred on a noninteroperable traffic section managed by the railway undertaking SC RC CF TRANS SRL Braşov.

At the accident place, the railway infrastructure is maintained by the Line Permanent Way Târnăveni – Praid Team.

On the traffic section Blaj-Praid, the train's running is made using the interlocking system.

On the distance Praid - Târnăveni Vest, the wagons were hauled by SC RAIL FORCE SRL Braşov on the basis of SC TRANSFEROVIAR GRUP SA Cluj Napoca order.

The handing-over of the empty wagons by SC TRANSFEROVIAR GRUP SA Cluj Napoca to SC RAIL-FORCE SRL Braşov, for transport from the railway station Praid, was performed only through handover-receipt signatures on the list of wagons with the mention „handed without lacks or other railway safety irregularities, without mentioning the date or handing-over place.



The wagons involved in the accident were rented by SC TRANSFEROVIAR GRUP SA Cluj from SC DANIC-DEHEL SRL and Rail Cargo Ungaria.

The engine drivers and the train crew of the freight train no. 99962 belong to the railway undertaking SC RAIL FORCE SRL Braşov.

### **B.2.2. Train composition and equipments**

The freight train no. 99962 was composed by 11 wagons loaded with salt, 44 axles, 861 tonnes (from which 388 tonnes automatically braked according to the timetable working, actually-automatically braked 584 tonnes, necessary - braked by hand 86 tonnes and actually braked by hand 120 tonnes with a length of 179 metres. According to freight train's timetable working for the branch of Regional Centre for Railway Operation, Maintenance and Repairs – Braşov that was available from 11<sup>th</sup> of December 2011, page no. 420, the maximum tonnage of a train hauled with a locomotive type DHC, on the distance Praid-Târnăveni Vest is by 1200 t. The train number „99962” is an additional train number allocated to the railway undertaking SC RAIL FORCE SRL through the „Disposal for implementation the train's timetable working” available from 11<sup>th</sup> of December 2011.

The automatic train brake was active, the hauling locomotive's vigilance and safety device (DSV) and the INDUSI equipment were sealed, active and in operation. The radiotelephone equipment and the buffing gears were in good condition, the board devices in operation.

### **B.2.3. Railway equipments**

#### ***Track description***

The derailment one occurred in a constant - radius curve with a radius  $R=230$  m, overwidening  $s=20$  mm, cant of track  $h=55$  mm, curve with left deviation in the train running direction.

#### ***Description of the track superstructure***

At the accident site, the track superstructure was made by rail type 49 on wooden sleepers, indirect fastening type K. At the accident date, the broken stone prisms was choking 90 % (the vegetation was increased).

The running on the distance Praid – Sovata is made with the speed of 30 km/h (the allowed speed according to the timetable working).

### **B.2.4. Communication means**

The communication between the engine driver and the station movement inspectors was insured by radiotelephone equipment.

### **B.2.5. Start of the emergency plan**

Soon after the railway accident, the intervention plan for the removal of the damages and for the traffic's restoration was made in accordance with the information flow stipulated in the Investigation Regulation, approved by the Government Decision no. 117/2010, according which, at the accident place came the representatives of the private railway infrastructure manager SC RC CF TRANS SRL Braşov, of the freight railway undertaking SC RAIL FORCE SRL Braşov and of Romanian Railway Safety Authority - ASFR.

### B.3. Accident consequences

#### B.3.1. Fatalities or injuries

None.

#### B.3.2. Material damages

Valoarea pagubelor materiale în conformitate cu devizele întocmite de către proprietarul materialului rulant și gestionarul infrastructurii feroviare private, este următoarea:

- **At the wagons involved in the accident**  
estimated, according to the act no. 1/10969/19.11.2012 of  
SC TRANS FERVIAR GRUP SA **8669 lei**
- **At the lines** **267,45 lei**
- **At the equipments** **None**  
.....
- Total value of damages** **8936,45 lei**

#### B.3.3. Accident consequences in the railway traffic

Due to the accident, in the trains running one occurred delays:

- the train no. 99962 delayed 180 minutes;

### B.4. External circumstances

On the 11/12<sup>th</sup> of October 2012, in the time interval 23:00 - 01:00 the visibility was good, clear sky, no wind, air temperature 5 °C.

### B.5. Investigation

#### B.5.1. Summary of the involved staff testimonies

##### *Summary of the railway undertaking staff testimonies*

**The engine driver** of the locomotive DHC 881 that hauled the freight train no. 99962, stated the following:

- he was on duty on the 11/12 of October 2012 and hauled the freight train no. 99962;
- at the entry in the railway station Sovata, he received from the conductor a stop communication;
- he took measures for train emergency stop and performed a quick braking;
- after the train stop, he found out that the ninth and tenth wagons were derailed, each by first bogie in the running direction;

**The conductor** of the freight train no. 99962, stated the following:

- he hauled the freight train no. 99962, on the 11/12 of October 2012 ;
- before the extrem switch, at a distance of about 30 m, he observed the derailment and communicated the necessity of the train stop;

- after the train stop, he found out that the ninth and tenth wagons from the head of the train were derailed; each by the first bogie (in the train running direction) and noticed the pointsman from the railway station Sovata;

### ***Summary of the infrastructure manager's staff testimonies***

**The pointsman** that was on duty on the 11/12 of October 2012 in the railway station Sovata, stated the following:

- during the train stabling operations on the line 2, after it's stop without being stabled, he was noticed by the train conductor that the ninth and tenth wagons from the head of the train were derailed by one bogie;
- he noticed the railway station manager, the dispatcher and the traffic controller;

**The holder ganger** from the Line Permanent Way Târnăveni – Praid Team, stated the following:

- the last inspection on the accident area was performed on the 29<sup>th</sup> of September 2012;
- at that date, he found out that the sleepers and the fastening were in a poor condition and verbally noticed the gang foreman;

**The substitute ganger** from the Permanent Way District Târnăveni – Praid Team, stated the following:

- he performed the last check on the 11<sup>th</sup> of October 2012 (when he was the substitute of the holder ganger)
- at that date, he found out that the sleepers and the fastening were in a poor condition and verbally noticed the gang foreman;

**The gang foreman** within Permanent Way District Târnăveni, stated the following:

- on the accident area, he performed the last quarterly inspection on the 24<sup>th</sup> of September 2012;
- at that inspection, he found out that many sleepers were in a poor condition (he have been verbally informed about this situation by the ganger)
- he performed checks on that area with the gauge measure but he did not registered this in register;
- there were no works after the last measurements that were performed on the 17<sup>th</sup> of July 2012 with the testing and recording car;

**The head** of the Permanent Way District Târnăveni, stated the following:

- on the accident area, he performed the last quarterly inspection on the 24<sup>th</sup> of September 2012;
- at that inspection, he found out that many sleepers and fastenings were in a poor condition;
- he did not take additional measures of traffic safety because in that area the speed was of 30 km/h and was really necessary to replace the wooden sleepers;
- after the measurements that were performed with the testing and recording car on the 17<sup>th</sup> of July 2012, he received the wagon's tape and the note with the existing faults;

**The Permanent Way District superintendent** within SC RC-CF TRANS SRL, stated the following:

- the tape of the testing and recordings car was handed by the Line Maintenance Section 9 Alba Iulia within railway branch Braşov to the head of the Permanent Way District Târnăveni;
- he did not see the decoded wagon's tape, only the measurements recorder;



- by phone, he ordered to the head of the Permanent Way District to check on the field all the points that exceeded the allowed tolerances;
- because of the high temperatures from the track in that period, there were not scheduled line interventions to remedy the faults that were recorded by the testing and recording car;
- the head of the Permanent Way District did not give attention to the faults that were recorded by the testing and recording band and especially to the fault from the derailment area that was mentioned on the band but it was not marked on the tape and on the measurements recorder;
- he did not check the registers of the Permanent Way District with the line measurements in curve;
- the accident causes were the line condition and the gauge problems;

### **B.5.2. Safety and management system**

At the moment of the accident, SC RC-CF TRANS SRL Braşov, as manager of the railway infrastructure, had the next documents:

- Safety Authorization – Part A, identification number – ASA 08001 – by which Romanian Railway Safety Authority, from Romanian Railway Authority – AFER agrees the acceptance of the safety management system of the railway infrastructure manager, issued on the 17<sup>th</sup> of June 2008 with valability until 27<sup>th</sup> of June 2018 and the last priodical visa had valability until to 27<sup>th</sup> of June 2014;
- Safety Authorization – Part B, identification number ASB 12007 – by which Romanian Railway Safety Authority, from Romanian Railway Authority – AFER agrees the acceptance of the dispositions taken by railway infrastructure manager in order to comply with the specific requirements necessary to ensure the railway infrastructure safety, in the designing, maintenance and operation, including if case, maintenance and operation of the system for the traffic control and signalling, issued on the 27<sup>th</sup> of June 2012 with valability terms until to 27<sup>th</sup> of June 2018 and the last priodical visa had valability until to 27<sup>th</sup> of June 2014;

Whithin the Safety Authorization – Part B is also mentioned the traffic section Blaj – Târnăveni Vest – Praid, with a lenght of 113,4 km.

The conclusions of the last audit that was performed by Romanian Railway Authority on the 04<sup>th</sup> - 05<sup>th</sup> of Octobre 2012 showed that the organisation had documented, prepared and implemented „a quality management system according to the reference standard SREN ISO 9001: 2008, focusing on the maintenance and improving of it’s effectiveness”. The management systems certification body (OCSM – AFER), issued the Certificate Series No. 112 with valability until 03<sup>th</sup> of Novembre 2014.

SC RC-CF TRANS SRL Braşov has drawn up the Handbook of Integrated Management, having as objectives:

- the reducing of the railway accidents and incidents by ensuring the preventive maintenance of the railway infrastructure which had in management;
- the increasing of the transport safety on the noninteroperable railway infrastructure;

At the moment of the railway safety, SC RAIL FORCE SRL Braşov as freight railway undertaking, had the next documents regarding it's own management of railway safety:

- Licenţa pentru efectuarea serviciilor de transport feroviar nr. 33 din data de 16.11.2009 pe perioadă nedeterminată cu revizuire la doi ani, ultima revizuire fiind efectuată în data de 10.11.2011;
- Railway Safety Certificate – Part A – CSA 0028, identification number UE: RO 1120110028, valability 31.12.2011 – 31.12.2013 for „services of railway transports - type B (freight railway transport performed in public or private interest), including the transport of dangerous goods.
- Railway Safety Certificate – Part B – CSB 0160, identification number UE: RO 1220120160, valability 26.09.2012 – 31.12.2013 for „services of railway transports - type B (freight railway transport performed in public or private interest), including the transport of dangerous goods.

Whithin the Railway Safety Certificate – Part B – are also mentioned the hauling section (Blaj – Târnăveni Vest – Praid and return) and the train's hauling locomotive DHC 881.

SC RAIL-FORCE SRL Braşov has drawn up Handbook of Integrated Management.

### **B.5.3. Norms and regulations. Sources and references for investigation.**

At the accident investigation were taking into account the following:

#### Norms and regulations

- Regulation for the railway technical operation No. 002/2001;
- Instruction regarding the terms of the track inspections no. 305/1997;
- Instruction of the Permanent Way District's head for track maintenance no. 323/1965;
- Instruction on maintenance activity of the gang foreman no. 322/1972;
- Instruction for pointsmen and dangerous points no. 321/1972;
- Instruction of norms and tolerances for constructions and maintenace of the lines with normal gauge no. 314/1989;
- Instruction for using the testing and recording car no. 329/1972;
- Instructions on technical inspection and maintenance of the wagons in operation no. 250/2005;

#### Sources and references

- copies of the documents requested by the members of the investigation commission;
- photos taken soon after the railway accident by the members of the investigation commission;
- documents on the maintenance of the lines, provided by the persons in charge with their maintenance;
- the results of the measurements performed soon after the railway accident at the track superstructure;
- the results of the measurements performed at the axles of the derailed wagon's bogies inspection and interpretation of the technical condition of the elements involved in the accident: infrastructure, railway equipment and train.
- questionnaires of the employees that were involved in the occurrence of the railway accident;

## **B.5.4. Operation of the technical equipments, infrastructure and rolling stock**

### **B.5.4.1. Data on line**

#### *Technical condition of the line*

There were performed checks of the track and of the cross level in the point with the first track of wheel fallen from the left (considered the point 0) and in five points, at equidistances of 2,5 m, in opposite direction of the train running.

The measured value of the gauge (respectively the distances between the active faces of the rails) in the point with first traces of fallen was of **1490 mm**. The value was measured with the tape measure and exceeded the maximum value from the Instruction of norms and tolerances for constructions and maintenance of the tracks with normal gauge no. 314/1989, article 1, point 13.

*In the measuring points 1-4*, the gauge values were of 1466 mm, 1464 mm, 1458 mm and 1463 mm, from which in the first point the value was outside the operation tolerances that are allowed by the provisions from Instruction of norms and tolerances for constructions and maintenance of the tracks with normal gauge no. 314/1989, article 1, point 14.1, item c.

In the measuring point no. 5, at a distance of 12,5 m before the fallen of the left wheel, the gauge value was of **1471 mm**, value that exceed the maximum value that is allowed by Instruction of norms and tolerances for constructions and maintenance of the tracks with normal gauge no. 314/1989, article 1, point 13.

There were performed measurements between the point 0 and the first point of measuring, respectively at the joint situated at 43 cm before the point 0 in the train running direction. The values that were obtained at the head of the rails that make up the joint being of **1486 mm** respectively of **1490 mm** in the train running direction. This values represent the distances between the active faces, measured with the tape measure and exceeded the maximum value that is allowed by the Instruction of norms and tolerances for constructions and maintenance of the tracks with normal gauge no. 314/1989, article 1, point 13.

The values that were obtaine at the cross level were according to the tolerances that are allowed by the Instruction of norms and tolerances for constructions and maintenance of the tracks with normal gauge no. 314/1989, article 7, point A.1.

At the checking of the technical condition of the sleepers and of the way in which was insured the fastening of metal plates by these, one found out that a number of 7 consecutive sleepers was in a poor condition with longitudinal cracks, starting with the point 0 in the train running direction. There were found out that the broken stone prisms was chocked 90 % - *photo no. 4-5*.





*photo no. 4* – the sleeper from the falling point of the left wheel



*photo no. 5* – the second sleeper after the falling point of the left wheel

According to the curves inspection sheet, the measurements performed on the 29<sup>th</sup> of March 2012, into a point situated on the accident area, the gauge value was of +35 (1470) mm.

At the measurements that were performed with the testing and recording car on the 17<sup>th</sup> of July 2012, according to the tape for a distance of about 3-3,5 m the track gauge exceeded the maximum value that is allowed by the Regulation of Technical Operation.

We mention that the documents and the statements that were made available by the staff with track maintenance responsibilities show us that there were not carried out rectification works after the both performed measurements.

#### **B.5.4.2. Data concerning the operating of the rolling stock of its technical equipments**

***Preliminary findings performed at the derailment place of the wagon's no. 338767359288 and no. 315559724853.***

The freight train no. 99962, composed by 11 wagons and loaded with salt was corresponding coupled, the brakes were in operation, the empty-load and goods-passengers exchangers were in corresponding positions with the wagon's load.

The wagon no. 338767359288 (*the ninth from the locomotive*), series Fas is a four axles wagon with cast wheels, metalic construction, discontinuous traction, cylindrical buffers of high capacity, bogies type „Y”, the handles of the empty-load and goods-passengers exchangers were in corresponding positions, the wagon tara 26 400 kg, load capacity of 53 400 kg.

According to the wagon's inscriptions (6/REV/USG/20.12.07 - + 3M), this was within periodical inspection term.

At the involved wagon were found out the following:

- the wagon was derailed by the first bogie in the running direction, the bogie with the wheels 1-2, 3-4, the wheels 1 and 3 being on the left part of the running direction;
- after the measurements that were performed at the derailed bogie, one found out that the distance between the outer faces of the wheels lips from the axle no.1 (in the running direction), had a value of ***1406,5 mm***, *opposite to the provisions of the Regulation for railway technical operation no. 002, Article 221 (2)*;
- the axles of the first bogie are not crooked;
- on the buffers (the front and rear) were not found out traces of abnormal friction in order to led at the conclusion of a running that did not respect the instruction (abnormal contact) between the wagon no. 9 and the front and the rear wagons. (*photo no. 6*)





*photo no. 6 – the frontal buffers of the wagon no. 9*

The wagon no. **315559724853**, series Eas-y (the tenth from the locomotive), was a four axle wagon, discontinuous traction, cylindrical buffers of high capacity, bogies type ORE, the handles of the Goods – Persons and Empty – Load exchangers were in appropriate conditions, wagon tara 20 600 kg, load capacity 59 400 kg.

According to the wagon's inscriptions (6/REV/Sm/21.09.06 - + 3M), this was within the extension term of the periodical inspection.

At the derailed wagon were found out the next:

- the wagon was derailed by the first bogie in the train running directions, the bogie with the wheels 5-1, 6-2, the wheels no. 5 and 6 on the left part;
- after the measurements that were performed at the derailed bogie, one found out that the measured values were in the instructional limits;
- after the performed measurements one found out that the axles of the first bogie are not crooked;
- the bogie frame had deformation traces;
- on the buffers (the front and rear) were not found out traces of abnormal friction in order to led at the conclusion of a running that did not respect the instruction (abnormal contact) between the wagon no. 10 and the front and the rear wagons. (*photo no. 7*)





*photo no. 7 – the frontal buffing gear of the wagon no. 10*

According to the weight ticket no. 2685/10<sup>th</sup> of Octobre 2012, the wagon no. **338767359288** had a neto load of 53 000 kg, a gross load of 79 400 kg, and *according to the weight ticket no. 2684/10<sup>th</sup> of Octobre 2012, the wagon no. 315559724853* had a neto load of 59 000 kg and a gross load of 79 600 kg. The wagons were loaded in Praid salt mine, where the last metrological check of the weight was performed on the 26<sup>th</sup> of Octobre 2011 (with validity term of 1 year).

### ***Findings performed at the locomotive***

At the hauling locomotive DHC 881, the safety and vigilance equipment (DSV) and the (INDUSI) equipment were sealed, active and in operation. The radiotelephone equipment and the board devices were in good condition.

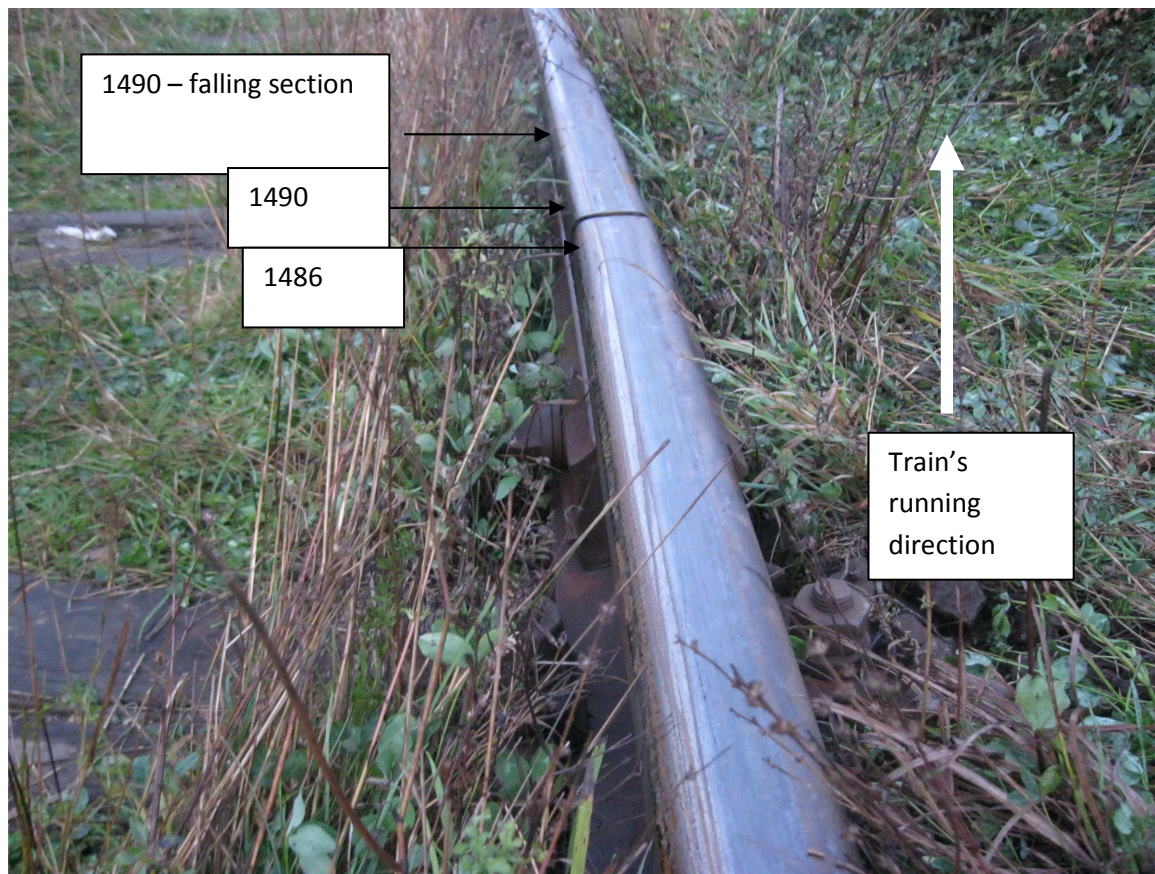
According to the report of the reading of the speed recording tape, the train left from the railway station Praid at 23:47 o'clock. After the stopping at the second level crossing (00:06 o'clock), the train ran (with speeds between 10 km/h and 29 km/h) a distance of about 2000 m and stopped (00:13 o'clock).

## **B.6. Analysis and conclusions**

### **B.6.1. Conclusions regarding the technical condition of the track superstructure**

The track overwidening at the km 106+692 (the gauge value being of **1490 mm**), one occurred because of the poor condition of the sleepers (longitudinal cracks on the coach screw direction) and of the broken stone prism that was choked 90%.

At the joint that is at about 43 cm before the ponit 0 in the running direction, the values that were obtained at the heads of the rails that make up the joanta were at **1486 mm** respectively **1490 mm** in the train running direction, the values between the active faces, measured with the tape measure that the exceeded the allowed maximum value of Instruction of norms and tolerances for constructions and maintenance of the line with normal gauge no. 314/1989, article 1, point 13. (photo no.8)



*foto nr. 8 – the joint before the falling point and gauge values from the outside rail of the curve*

The poor condition of the sleepers and of the fastening that were found out in the area before and after the accident place did not show signs to confirm the fact that this condition appeared in the moment or after the railway accident, respectively the fallen of the first wheel from the left part of the running direction between the stretch of rail and its running on the head of the vertical bolts.

### **B.6.2. Conclusions regarding the technical condition of the derailed wagons**

According to the measurements that were performed by authorized staff with devices certified by Romanian Railway Authority, the distance between the outer faces of the wheel lips, measured between 2 points situated at 10 mm over the running treads, at the first wheel in the running direction had the value of 1406,5 mm, contrary to the provisions of the Railway Technical Operation no. 002, Article 221 (1) and (2) item a.

## **B.7. Accident causes**

### **B.7.1. Direct cause, contributing factors**

The accident's direct cause was the value of the gauge that exceeded the maximum value allowed by the prescriptions of the Instruction of norms and tolerances for construction and maintenance of the lines with normal gauge no. 314/1989 (chapter 1, article 1 – item 13).

Contributing factors:

- the inappropriate condition of the sleepers that permitted the increasing of the gauge over the allowed value in operation;
- the inappropriate condition of the wagon no. 33876735928-8 that had a characteristic failure at the axle no.1 (the distance between the outer faces of the flange of wheels was under the minimum limit that is allowed by the provisions of the article 221(2), item (a)

from the Regulation of Railway Technical Operation no. 002/2001.

**B.7.2. Underlying causes.**

- the track maintenance works and inspections were not properly performed;
- were not checked the main conditions that must to comply the pairs of wheels at the hauled railway vehicles for being allowed to ran on railway infrastructures lines;

**B.7.3. Root causes.**

None.

**C. SAFETY RECCOMENDATIONS**

None.

This Investigating Report will be transmitted to Romanian Railway Safety Authority, to the non-interoperable railway infrastructure SC RC CF TRANS SRL Braşov, to the freight railway undertakings SC RAIL FORCE SRL Braşov and SC TRANSFEROVIAR GRUP SA Cluj-Napoca.

Membres of the investigating commission:

- Sever PAUL - Investigator - OIFR - main investigator
- Laurian CERNAT - Territorial Inspector - Railway Safety Inspectorate - ISF Braşov - membre
- Mihai MORUŞCA - Territorial Inspector - ISF Braşov - membre