



MINISTERUL TRANSPORTURILOR  
AGENȚIA DE INVESTIGARE FERROVIARĂ ROMÂNĂ - AGIFER



## ROMANIAN RAILWAY INVESTIGATION AGENCY- AGIFER

### ANNUAL REPORT 2018



## INTRODUCTION

This is the Annual Report of Romanian Railway Investigation Agency AGIFER (hereinafter referred to as AGIFER) for 2018. It is made in accordance with the *Regulations for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and metro safety*, approved through the Government Decision no. 117/2010 and meets with the requirement of the Directive 2004/49/CE of European Parliament and Council, transposed into Romanian legislation through the Law no.55/2006 for the railway safety.

This reference legislation is uploaded also on AGIFER site [www.agifer.ro](http://www.agifer.ro)

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## **1 PRESENTATION**

### **1.1 Foreword of AGIFER General Manager**

Presenting the activity report of Romanian Railway Investigation Agency– AGIFER, for 2018, my feelings are contradictory. Some feelings are concerns for the growing number of accidents/incidents, other ones are satisfaction for the professional and exemplary way how AGIFER team runs its tasks. I am concerned for the railway events, following the human errors; there are feelings of satisfaction generated by the prestige and place of AGIFER in national and European field.

The year 2018 was the third year from AGIFER setting up like independent body, subordinated to the Minister of Transports (following the transformation of Romanian Railway Investigation Body), having like main role, according to the national and European legislation, the improvement of the railway safety. This objective is achieved through the investigation of the accidents/incidents, respectively collection and analysis of information, setting of conditions, including determination of causes and, if case, issuing of some safety recommendations.

In 2018 AGIFER opened 58 investigations (against 41 in 2017) and finished 37 investigations. One can see an increase of the accidents/incidents number from year to year. In mention that in 2018 AGIFER opened an investigation for a serious accident happened on the 12th August 2018, in the railway county Craiova, on the running line track I, between the railway stations Malu Mare - Banu Mărăciine, on the viaduct Cârcea, km 200+306, in the running of the freight train no.80315.

Underfunding of the railway system, under sizing and lack of professionalism of the working force are the main causes (factors) that so affected the safety of Romanian railway network. It is alarming that these causes, that led to the increase of the number of accidents/ incidents, many of them, in slightly different conditions could lead to railway disasters, they did not raise the awareness of Romanian Railway actors.

I am sure that the economic targets can be reached also without affecting the traffic safety, only in a such way the railway system can become safely, competitive and performing.

The assessment of the risks, generally and of the maximum risk accepted especially is a very important problem for the factors responsible from Romanian railway field.

In 2018 AGIFER continued the cooperation with other European investigation bodies, sharing the good practices and participating in the meetings of the working groups of European Union Agency for Railways (Common reporting of the railway events-COR; Join meetings with NSAs and plenary meetings of NIB network; Investigation of railway accidents in Central Europe; Definition of the organization of NIB network; Development of a training program in the field of human and organization factors etc), as well as in the meetings of the Peer Review working group.

In acknowledgement of its activity, AGIFER was chosen to organize the 55th ESReDA seminar (European Safety Association for Safety Reliability and Data). This seminar was organized in Romania, in Bucharest, 9th – 10th October, with the name “Investigation of accidents and learning for the improvement of safety management in complex systems: remaining challenges”.

Beyond the hopes, I have belief and faith in the reestablishment of Romanian railway system, that has to demonstrate that it is part of the European one.

Finally, I'd like to thank all partener entities, with which AGIFER cooperated in 2018, European Union Agency for Railways, National Investigation Bodies and I'd like to thank to all AGIFER staff.

**General Manager**  
**PhD. Eng. Vasile BELIBOU**

## 1.2 Role and purpose

### Role of Romanian Railway Investigation Agency-AGIFER

AGIFER role is to carry out investigations of the accidents/incidents and to analyse and study the causes and circumstances that led to their occurrence. AGIFER can also perform other tasks established through Government Decision for the investigation of other events than the railway accidents and incidents.

According to the provisions of the Safety Directive, of Law no.55/2006 on the railway safety and of the Government Decision no.117/02.03.2010 for the approval of the Regulations for the investigation of the accidents and incidents, for the development and improvement of Romanian railway and metro safety (hereinafter referred to as *Investigation Regulations*), in making the decision for the opening of an investigation, AGIFER takes into account:

- seriousness of the accident or incident;
- if it is part of a series of accidents or incidents relevant for whole system;
- its impact on the community railway safety;
- requests of the infrastructure administrators, railway undertakings, Romanian Railway Safety Authority or of other member states of European Union

AGIFER does not investigate:

- railway incidents that are not relevant for the railway transport system;
- level crossing collisions between the running trains and road vehicles, that are not generating by the non-closing of the barrier or the malfunction of the signalling equipment;
- hits of the persons by the running railway vehicles;
- suicides;

For any of these above-mentioned cases, an investigation can be started, taking into account those presented in the previous paragraph.

### AGIFER purpose

Through the investigations of the accidents and incidents, AGIFER aims the improvement of the railway safety and prevention of some accidents and incidents with similar occurrence to those investigated.

The investigations, if necessary, have as final result safety recommendations, that are AGIFER proposal for the improvement of the railway safety.

## 1.3 General data about AGIFER

### Employees at the end of 2018

At the end of 2018, AGIFER had 42 employees, that is:

- 1 general manager;
- 1 deputy general manager;
- 1 economic director;
- 3 councillors of the general manager;
- 4 department heads;
- 22 investigators;
- 1 auditor;
- 5 experts

- 1 technician
- 1 referent
- 2 economists

Budget

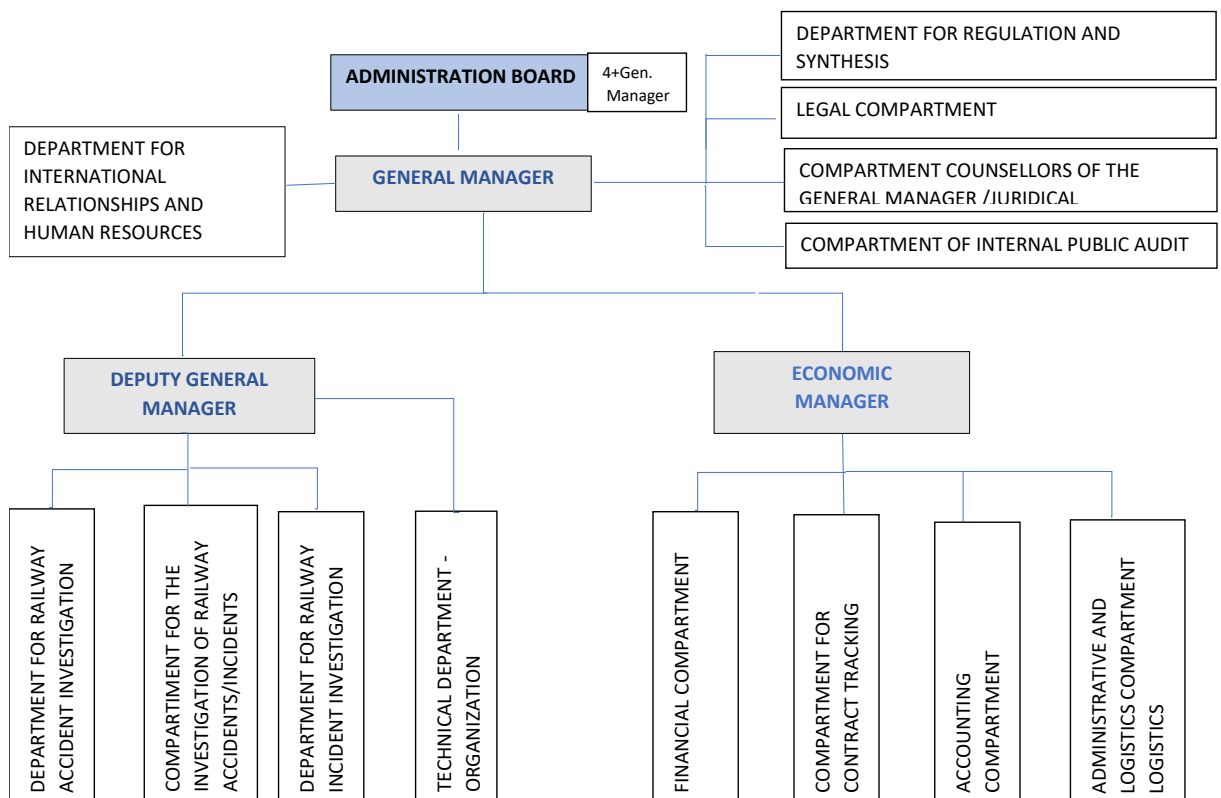
For its activity in 2018, AGIFER had a budget of 5.065.380 lei, that is 1.066.396 EUR (considering an exchange rate 1 € = 4,75 lei).

**1.4 Organization**

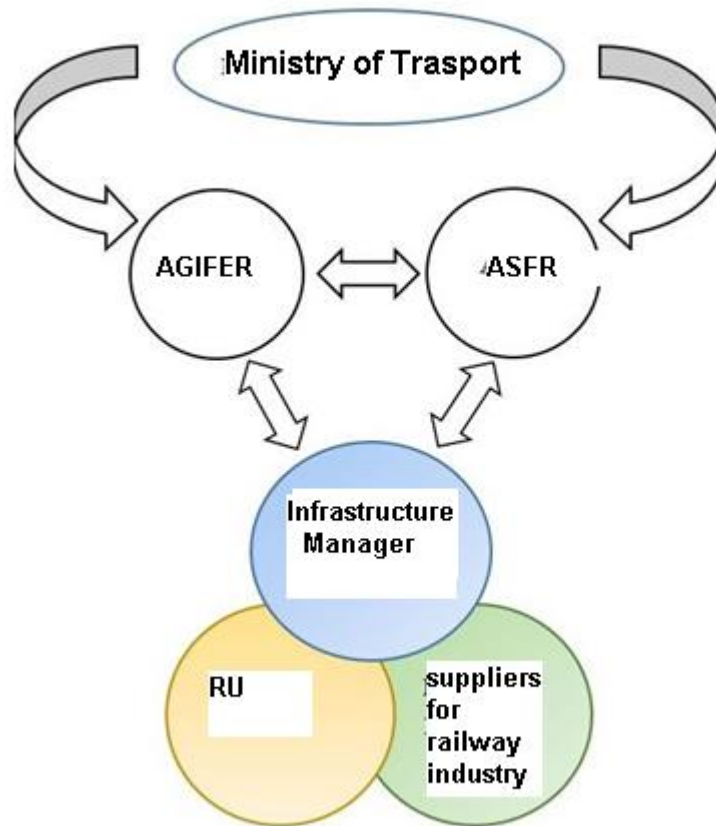
In 2018, through the Order of Minister of Transports no.1171/11.07.2018 the organization chart of Romanian Railway Investigation Agency – AGIFER was approved, it being presented below:

Total number of employees – 45

Vacancies - 3



## 1.5 Organization diagram



## 2 INVESTIGATION PROCESS

The investigation aims to prevent the accidents and incidents and includes the collection and analysis of the information, establishment of the conditions, including the determination of the causes and, if case, the issuing of some safety recommendations.

The investigation is, from legal point of view, an administrative act, allowing the main investigators to fulfil their tasks as efficiently as possible and as soon as possible. The investigation is independent of any legal inquiry. The investigation does not aim in any way the establishment of the degree of guilty or the responsibility.

The result of an accident or incident investigation is the subject of the investigation report, drafted according to the seriousness of the accident or incident.

The report presents the investigation objectives and includes, if case, safety recommendations.

Before drafting the investigation report ( the final investigation report) one works out a draft report, that, according to the provisions of the art 22(3) of the Law 55/2006, is submitted to the infrastructure administrator/manager, involved railway undertakings, Romanian Railway Safety Authority, victims and their relatives, owners of the damaged goods, manufacturers, involved emergency services and the representatives of the staff and the users in order to inform them about the investigation and its course and to give them the possibility to present their opinions on the investigation and to express their comments on the information of the draft report.

If the opinions and comments on the draft report are relevant for the investigation, they will be taken into account in the drafting of the final report.

The final form of the investigation report is submitted to the management of Romanian Railway Investigation Agency - AGIFER for endorsement and publishing on its site.

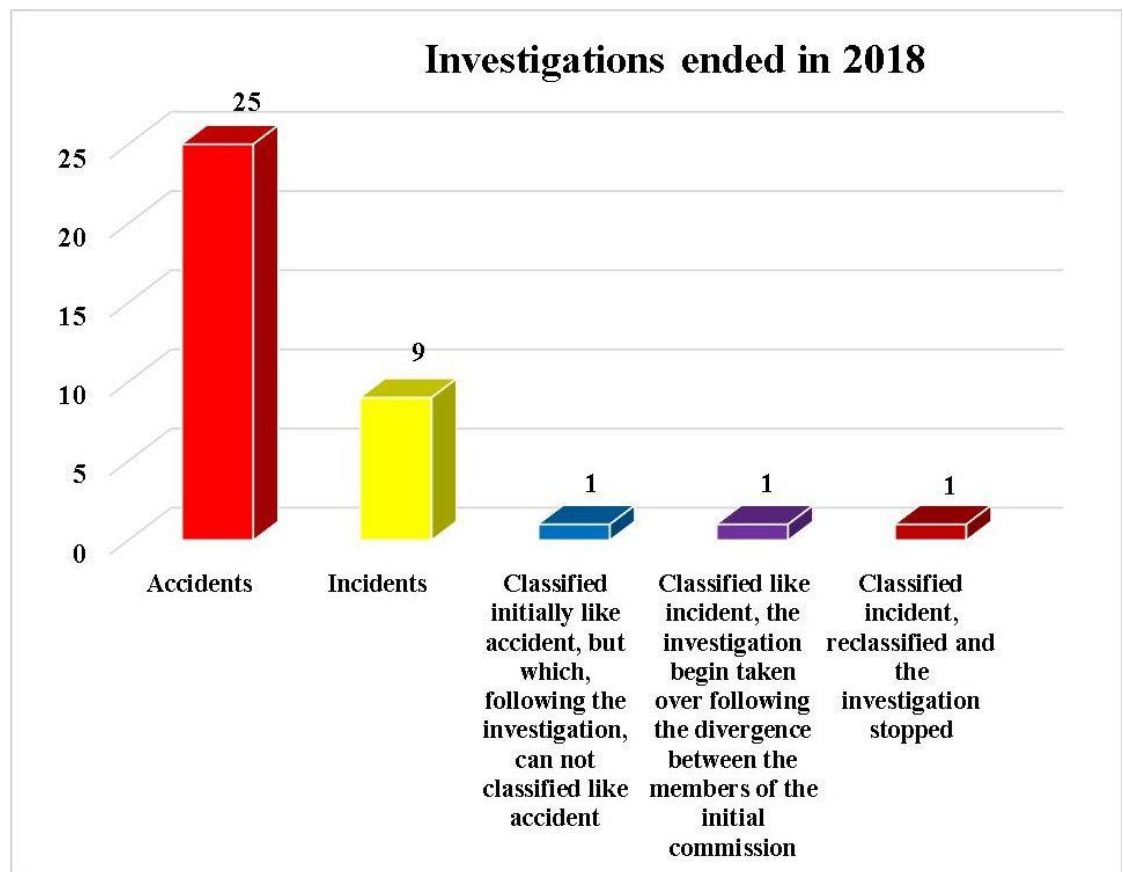
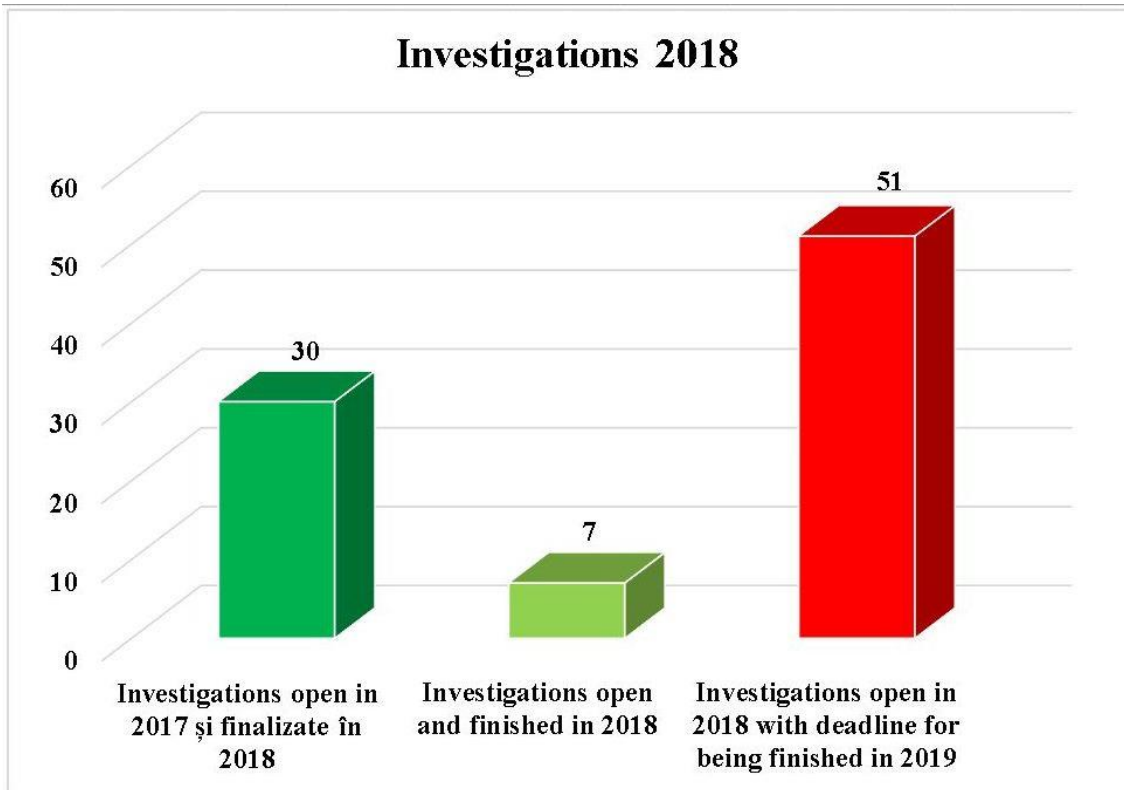
### 2.1 Investigated cases

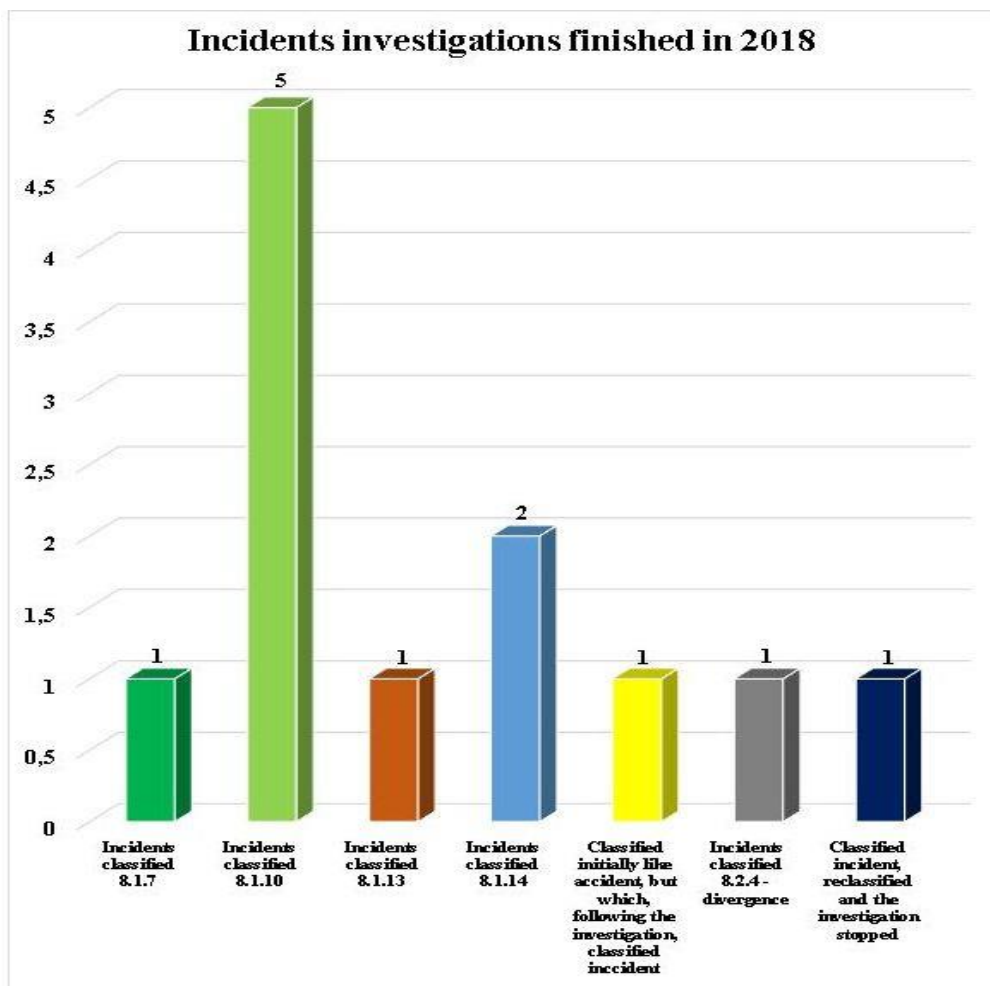
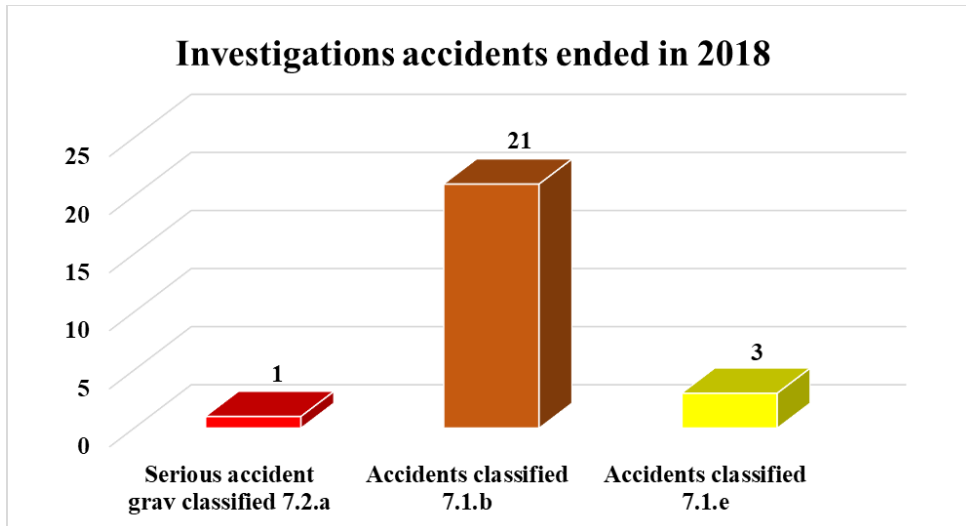
In 2018, AGIFER staff investigated **88** accidents/incidents, according to the provisions of Law no.55/2006 for the railway safety and of the Regulations for the investigation of accidents and incidents, for the development and improvement of Romanian railway and metro safety approved by the Government Decision 117/2010 – hereinafter referred to as *Investigation Regulations*. From those **88** investigations, **30** were opened in 2017, and the other ones of **58** were opened in 2018.

In 2018, one also finished and closed **37** investigations, respectively:

- 25 railway accidents;
  
- 12 railway incidents, from which:
  - One case classified initially according to the provisions of art. 7, letter b) from the *Investigation Regulations*, for which Romanian Railway Investigation Agency appointed an investigation commission, that, following the investigation, considers that cannot be classified like railway accident according to the provisions of the *Investigation Regulations*;
  - 9 cases classified according to the provisions of art.8.1 group A from the *Investigation Regulations*, for which Romanian Railway Investigation Agency ensured the investigator in charge;
  - 1 case classified according to the provisions of art.8.2 group B from the *Investigation Regulations*, for which AGIFER General Manager decided to start investigation and he appointed the members of the investigation commission, following the divergence between the members of the initial investigation commission (established at level of the railway actors involved);
  - 1 case classified according to the provisions of art.8.3 group C from the *Investigation Regulations*, for which AGIFER General Manager decided to start investigation and he appointed the members of the investigation commission, that, following the investigation, considers that it cannot be classified like railway incident according to the provisions of *Investigation Regulations* and the investigation was finished.







## 2.2 Situation of the investigations open/ended in the last 5 years

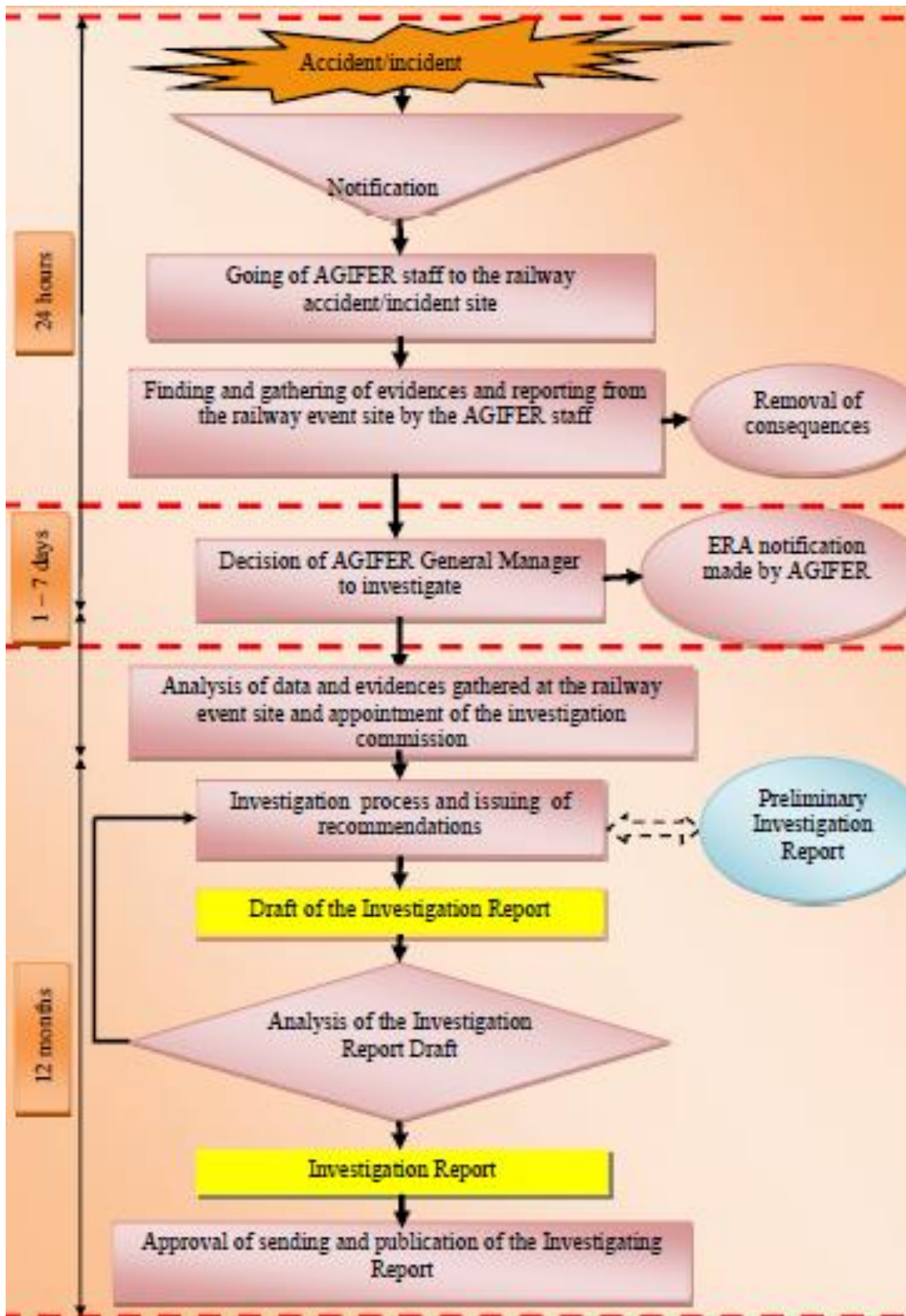
	Number of the investigations open			Number of the investigations ended		
	Accidents	Incidents	TOTAL	Accidents	Incidents	TOTAL
2014	25	27	<b>52</b>	19	21	<b>40</b>
2015	23	29	<b>52</b>	21	27	<b>48</b>
2016	29	17	<b>46</b>	23	14	<b>37</b>
2017	28	13	<b>41</b>	31	17	<b>48</b>
2018	32	26	<b>58</b>	25	12	<b>37</b>

## 2.3 Institutions involved in the investigation (currently or exceptionally)

From its setting up until now, during the investigations Romanian Railway Investigation Agency - AGIFER cooperated with the authorities in charge with the legal inquiry, as well as with other authorities with responsibilities of intervention at the accident/incident site.

According to the provisions of the art. 20, paragraph 4 of the Law no. 55/2006 concerning the railway safety, in the investigations, Romanian Railway Investigating Agency – AGIFER can use, if necessary, specialists from related fields. During 2018 there was no case of appointment of specialists outside AGIFER within the commissions for the investigation of the railway accidents.

## 2.4 Diagram of the investigation process



### 3 INVESTIGATIONS

#### 3.1 Overview of the investigations finished in 2018 as against to 2017, identification of the main tendencies

Type of the accidents investigated in 2018 <sup>(1)</sup>	Number of accidents	Number of victims		Damages (lei)	Damages (€)	Tendency of the accident number, as against to 2017 (difference between the number of cases and percentage)
		Dead	Seriously injured			
Trains collisions	0	-	-	-	-	-1 (-100%)
Trains derailments	22	2	-	7.655.868,78	1.645.185,08	-3 (-12%)
Road vehicles hit at the level crossings	0	-	-	-	-	0 (0%)
Fires in the rolling stock	3	-	-	499.848,56	107.413,46 €	-2 (40%)
<b>Total</b>	<b>25</b>	<b>2</b>	<b>-</b>	<b>8.155.717,34</b>	<b>1.752.598,55 €</b>	<b>-6</b> <b>(-19%)</b>

<sup>(1)</sup> one took into account the year of the investigation finishing.

#### 3.2 Investigations finished and started in 2018

In 2018 Romanian Railway Investigation Agency (AGIFER) finished and closed 37 investigations (from which 30 were investigations opened in 2017) and started the investigation in 51 cases for which the investigations open in 2018 are going to finished in 2019.

In the table below we present the investigations and their legal basis, taking into account the requirements of European Directive for the railway safety and of the national legislation

##### Investigation finished in 2018

No	Date of occurrence	Presentation	Legal basis of the investigation (1)	Date of finishing
1	07.02.2017	In the railway county Timișoara, track section Sânnicolau Mare – Cenad (noninteroperable track section, managed by RC-CF Trans SRL Brașov), <b>between Sânnicolau Mare and Cenad railway stations</b> , km.66+500, all the axles of the multiple unit AMX 526 derailed and the first two axles of the trailer vehicle no.57-326-9 from the passenger train no.14389 (got by the railway undertaking SC Regiotrans SRL Brașov).	i	17.01.2018
2	15.02.2017	In the railway county Cluj, track section Dej - Apahida, <b>between Dej and Dej Călători railway stations</b> km 0+690, in the running of the freight train no. 50477 (got by OTF UNICOM	i	12.02.2018

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		TRANZIT SA), the first bogie of the 4th wagon derailed, in the running direction.		
3	02.03.2017	In the railway county Timișoara, track section Petroșani–Simeria (electrified double-track line), in <b>Călan railway station</b> , km 12+700, the track inductor of 1000/2000 Hz afferent to the entry signal Y was hit by the inductor of the locomotive EA 272, hauling the train no. 59420A (got by the railway undertaking SC UNICOM TRANZIT SA).	iii	26.02.2018
4	28.02.2017	In the railway county Cluj, track section Halmeu – Satu Mare (non-electrified single-track line), km 807+730, <b>between Halmeu and Porumbești railway stations</b> , the both axles of the first bogie from the multiple unit ADH 1421, derailed, it running as passenger train no.4408 (got by the railway undertaking CFR CALATORI SA).	i	12.02.2018
5	15.03.2017	In the railway county Cluj, track section Baia Mare – Satu Mare (non-electrified single-track line), <b>between Baia Mare and Bușag railway stations</b> , km 52+667, the last axle of the trailing unit LVS 538 derailed, in the running direction (got by the railway passenger undertaking SNTFC “CFR Călători” SA), it running like passenger train no. 4313.	i	13.03.2018
6	27.03.2017	In the railway county Iași, track section Iași - Pașcani (electrified double-track line), in <b>Târgu Frumos railway station</b> , the route of the train R no.5524 (got by the railway undertaking SNTFC „CFR Călători” SA) was made wrong by the movements inspector on duty.	iii	23.03.2018
7	08.04.2017	In the railway county Timișoara, track section Petroșani - Simeria (electrified double-track line), <b>between Bănița and Merișor railway station</b> , on the track I, km.62+890, the hauling locomotive EA 759 and the first 14 wagons of the freight train no.50457 derailed (got by the railway undertaking SC UNICOM TRANZIT SA), leading to the death of the locomotive crew (driver, driver’s assistant).	i	03.04.2018
8	15.04.2017	In the railway county Brașov, track section Brașov-Sighișoara (electrified double-track line), <b>between Mureni and Beia railway stations</b> , on the track 1, km 267+060, all 4 axles of the first bogie from the breakdown crane EDK 2000 of 250 tf, in its running direction, derailed, being the 4th in the consist of the train no.28261-2, got by CNCF „CFR” SA.	i	12.04.2018

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
9	24.04.2017	In the railway county Timisoara, track section Petrosani – Subcetate (electrified double-track line) between <b>Bănița and Petroșani railway stations</b> , km 69+240, in the running of the freight train no. 50494 (got by the railway undertaking SC UNICOM TRANZIT SA) the first bogie of the 28th wagon derailed	i	20.04.2018
10	20.05.2017	In the railway county Timișoara, track section Livezeni – Lupeni, in <b>Livezeni railway station</b> , at the stabling of the freight train no.23815 (got by the railway undertaking SNTFM „CFR Marfă” SA), the first bogie from the 33rd wagon derailed, in the running direction.	i	16.05.2018
11	03.04.2017	In the railway county Craiova, in <b>Roșiori Nord railway station</b> , in the shunting activity the first bogie of the wagon no. 33530823183-6, got by Deutsche Bahn Cargo Romania SRL, derailed.	iii	25.01.2018
12	24.05.2017	In the railway county Timișoara, track section Arad–Curtici (electrified double-track line), in <b>Curtici railway station</b> , km.646+100, the cable for the earth connection from the pillar for the support of the overhead contact line LC25 was hit by the door of the wagon no.33535421161-7 Eaos (the 15th one from the locomotive), it being in the composition of the train no.50419 (got by the railway undertaking UNICOM TRANZIT SA).	iii	22.05.2018
13	28.05.2017	In the railway county Craiova, non-interoperable track section Băbeni – Alunu, <b>between Berbești and Popești Vâlcea railway stations</b> , km 27+200, a fire burst into the locomotive DA 1503, being the banking locomotive of the freight train no.79176 (got by the railway undertaking SC Grup Feroviar Român SA).	i	15.05.2018
14	07.06.2017	In the railway county Craiova, in <b>Golești railway station</b> , on the direct line II, in the running of the passenger train no.1782, consisting in the diesel multiple unit Desiro 2053 (got by the railway passenger undertaking SNTFC „CFR Călători” SA) the exit signal YII was passed in stop position, followed by the derailment of its first two bogies of the multiple unit on the line 2T,I in the running direction.	i	06.06.2018
15	08.06.2017	In the railway county Timișoara, track section Arad-Simeria (electrified double-track line), at the passing of the freight train no.90901 (got by the railway freight undertaking SC RAIL FORCE SRL), in <b>Milova railway station</b> , km 588+000, the second bogie of the wagon	i	06.06.2018

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		nr.31537887008-5, series Zaes (the 37th one of the train), derailed.		
16	15.07.2017	In the railway county Constanța, track section Făurei - Fetești (electrified double-track line), in <b>Țândărei railway station</b> , in the running of the freight train no.61733 (got by the railway undertaking SNTFM „CFR Marfă” SA), two wagons of the train derailed and overturned (the wagons 29 and 30 in the running direction).	<b>i</b>	11.07.2018
17	20.08.2017	In the railway county Cluj, track section Apahida–Oradea (non-electrified double-track line), in <b>Brăișoru railway station</b> , the diesel multiple unit DESIRO 2019 runaway on the running line Braisoru - Poieni, up to km 561+520. The diesel multiple unit has rested out of service in the railway station Brăisoru, switch 16, from the train no.3629 (got by the railway undertaking SNTFC „CFR Călători” SA).	<b>iii</b>	23.07.2018
18	02.09.2017	In the railway county Brașov, track section Sfântu Gheorghe-Siculeni (electrified single-track line), in <b>Băile Tușnad railway station</b> , the second bogie of the locomotive EA 078, hauling the passenger train IR no.1366-1, derailed, in the running direction (train got by the railway undertaking SNTFC „CFR Călători” SA),	<b>i</b>	23.08.2018
19	14.09.2017	In the railway county Constanța, in <b>Capu Midia railway station</b> , in the running of the freight train no.80464, got by the railway undertaking SC GFR SA, the second bogie from the 31 <sup>st</sup> wagon of the train, derailed in the running direction	<b>i</b>	12.09.2018
20	24.09.2017	In the railway county Cluj, track section Cluj Napoca - Dej Călători (electrified double-track line), in <b>Dej Călători railway station</b> , on the exit route of passenger train InterRegio nr.1765, got by the railway undertaking SNTFC „CFR Călători” SA, the hauling locomotive and those six cars from train composition derailed.	<b>i</b>	14.09.2018
21	06.10.2017	In the railway county Brașov, in <b>Brașov Triaj railway station</b> , during the stabling of the freight train no.50462 ( got by the railway undertaking S.C. UNICOM TRANZIT S.A), hauled with the locomotives EA 531 and EA 386 (banking ones) on the line no. 10A, the first axle from the locomotive EA 386 derailed in the running direction.	<b>i</b>	04.10.2018
22	30.10.2017	In the railway county București, at the exit of train IR no.1741 (got by the railway	<b>i</b>	24.10.2018



No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		undertaking SNTFC „CFR Călători” SA) from the line 14 of <b>București Nord railway station</b> , the first axle of the first bogie, from the locomotive EA 892 derailed		
23	31.10.2017	In the railway county București, track section Ploiești Vest - Brașov (electrified double-track line), between <b>Comarnic and Câmpina railway stations</b> , track II, km. 104+400, in the running of, the freight train no.21753-2 (got by the railway freight undertaking SNTFM „CFR Marfă” SA), there were dangerous goods leakages and smoke at the 17th wagon of the train.	iii	18.10.2018
24	08.11.2017	In the railway county Iași, in <b>Vicșani railway station</b> , the entry semaphore A <sub>1/2</sub> was passed in stop position, it having the position „ <i>STOP without passing the signal in stop position</i> ”, by the freight train no.56306 (got by SNTFM „CFR Marfă”).	iii	06.02.2018
25	13.11.2017	In the railway county Constanța, in <b>Constanța Mol V railway station</b> , line connection Racord II, at the dispatching of the light engine EA 2002 (got by SC Deutsche Bahn Cargo România SRL), running like train no. L 39896, light locomotive, on the connection 2 track II to Palas, its second bogie derailed, in the running direction, on the switch Ys.	i	03.07.2018
26	16.11.2017	In the railway county București, <b>București Triaj railway station</b> , at the signal cab no.17, km 0+400, in the area of the switch no. 23, the first bogie from the wagon no.338178500249, being the second one of the freight train nos. 70966, got by the railway undertaking MMV Rail România SA, derailed.	i	08.08.2018
27	20.11.2017	In the railway county Constanța, track section Ciulnița – Călărași Sud, <b>between Ciulnița and Călărași Nord railway stations</b> , km 12+775, in the running of the freight train no.50541 (got by the railway undertaking SC Unicom Tranzit SA), the second bogie of the 31st wagon derailed in the running direction	i	16.11.2018
28	05.12.2017	In the railway county Brasov, track section Brașov – Sighișoara (electrified double-track line), km251+700, between <b>Cața and Rupea railway stations</b> , a fire burst into the locomotive	i	03.12.2018

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		EC 536, hauling the freight train no. 90970, got by the railway undertaking SC RAIL FORCE SRL Braşov.		
29	12.12.2017	In the railway county Braşov, track section Braşov - Sighişoara (electrified double-track line), <b>between Racoş and Rupea railway stations</b> , on the track II, km 237+950, in the running of the freight train no.20912, got by the railway undertaking SC Cargo Trans Vagon SA, the first axle from the first bogie of the locomotive ED 061, being hauled within the composition of the train.	<b>i</b>	11.12.2018
30	13.12.2017	In the railway county Craiova, track section Goleşti - Costeşti, <b>between Goleşti and Bradu de Sus railway stations</b> , km 2+090, in the running of the freight train no.31700-1, (got by the railway undertaking SNTFM "CFR Marfă" SA) the second wagon after the locomotive derailed	<b>i</b>	13.11.2018
31	01.01.2018	In the railway county Cluj, track section Beclean pe Someş - Dej Călători (electrified double-track line), in <b>Dej Triaş railway station</b> , km 2+400, on the line 1C, in the running of the passenger train Regio no.4111 (got by the railway undertaking SNTFC „CFR Călători” SA), both axles of the second bogie from the third cars no.50532055008-8, after the locomotive, derailed in the running direction.	<b>i</b>	19.12.2018
32	30.01.2018	In the railway county Galaţi, track section Buzău–Făurei (electrified double-track line), in <b>Cilibia railway station</b> , the supports for the protection of the track inductors supports of 1000/2000 Hz, afferent to the light signals YF and YII, were hit by the locomotive inductor EA 552, hauling the train no.1732 (got by the railway undertaking SNTFC „CFR Călători” SA).	<b>iii</b>	14.03.2018
33	23.02.2018	In the railway county Braşov, in <b>Lunca de Sus railway station</b> (end X, from km.122+ 300 up to km.122+400), the control rods and DAM covers from the switches no. 1 and 5, were hit by the locomotive of the passenger train Regio no.5122 (got by SNTFC CFR Călători SA),	<b>iii</b>	27.03.2018
34	24.02.2018	In the railway county Bucureşti, in <b>Bucureştii Noi railway station</b> , Group C, in the running of the freight train no.71711-2 (got by the railway undertaking SNTFM „CFR Marfă” SA), on the line 2C, switch no. 10C, the first axle of the	<b>i</b>	04.12.2018

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		locomotive ED 030 derailed in the running direction of the train.		
35	17.05.2018	On the main line IV of METROREX SA, in <b>Străulești and Laminorului metro stations</b> , the boxes of the electric switch machine from the switch no.6 were hit by the third rail contact shoe of the current collector no.1 left, being on the bogie 1 of REM 109 from the composition of the metro train 54.	iii	21.06.2018
36	24.07.2018	In the railway county <b>București</b> , track section București – Videle (electrified double-track line), track I, <b>between Zăvestreni and Videle railway stations</b> , km.42+531, the impedance bond afferent to the track circuits delimited by the signal PrXB, by the brake beam detached from the wagon no.338727536231 (the 10th one from the locomotive) being in the composition of the train no.71712 (got by the railway undertaking SNTFM „CFR MARFĂ” SA).	iii	30.10.2018
37	25.10.2018	In the railway county Timișoara, in <b>Topleț railway station</b> , end Y, parts of the railway vehicles (brake shoes) fell, leading to the derailment of the second axle of the first bogie (in the running direction) from the wagon no.33530823236-2 of the freight train no.30626 (got by the railway undertaking SC DEUTSCHE BAHN CARGO ROMÂNIA SRL).	iii	06.11.2018

(1) **Legal basis of the investigation:** i= According to the Safety Directive, ii= Upon the national legal basis (that covers the possible areas excluded by the art.2, paragraph 2 of the Safety Directive), iii= Optional – other criteria (National norms/regulations, to which the Safety Directive does not refer).

## Investigations open in 2018 that are to be finished in 2019

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
1	15.01.2018	In the railway county Iași, track section Suceava - Dărmănești (electrified double-track line), in <b>Suceava railway station</b> , the both pantographs from the locomotive EC 126, hauling the passenger Regio no.5454 (got by the railway undertaking SNTFC „CFR Călători” SA) broke and the overhead contact line disconnected accidentally.	iii	14.01.2019
2	01.02.2018	In the railway county Craiova, on <b>the running line between Valea Albă and Drobeta Turnu Severin Marfuri railway stations</b> , km 349+819, in the running of the freight train no.80592-1, got by the railway undertaking SC Grup Feroviar Român SA consisting in 20 tank wagons loaded, the 16th wagon overturned and the 17th, 18th and 19th ones derailed.	i	30.01.2019
3	13.02.2018	In the railway county București, track section București Sud – Berceni (electrified single-track line), <b>between București Sud and Berceni railway stations</b> , km 37+489, in the running of the freight train no.86102 (got by the railway undertaking SNTFM „CFR Marfă” SA), the second bogie of the 14th wagon (the last but one of the train) derailed in the running direction	iii	12.02.2019
4	05.03.2018	In the railway county Brașov, in <b>Sfântu Gheorghe railway station</b> , in the running of the freight train no.99866 (got by the railway undertaking Rail Force SRL), the both axles of the first bogie from the wagon no. 335449600253 (first in the train composition) and the second bogie of the locomotive DHC 742 derailed in the running direction.	i	04.03.2019
5	15.03.2018	In the railway county Cluj, track section Sighetu Marmăției – Salva, non-electrified single-track line, in <b>Dealul Ștefăniței railway station</b> , , in the running of the freight train no.42564, hauled by the locomotive DA 1158, got by the railway undertaking SNTFM „CFR Marfă” SA, the first bogie of a wagon loaded with wooden material derailed, being the 27th one of the train.	i	12.03.2019
6	18.03.2018	In the railway county Constanța, non-interoperable track section Palas – Năvodari got by SC Grup Feroviar Român SA, km.1+400, <b>between Palas and Constanța Mărfuri railway stations</b> , in the running of the freight train no.89965, hauled by the locomotive DA 1562, (got by the railway undertaking SC Tehnotrans Feroviar SRL), the	i	11.03.2019

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		19th wagon (reclined at 45°) and the 20th wagon (overturned) from the locomotive, derailed.		
7	20.03.2018	In the railway county Craiova, track section Filiași – Târgu Jiu, in <b>Turceni railway station</b> , km 14+300, in the running of the freight train no.23633, hauled by the locomotive ED 040, got by the railway undertaking SNTFM „CFR Marfă” SA, two wagons of the train derailed (the 4th and the 5th wagons after the locomotive)	i	12.03.2019
8	30.03.2018	In the railway county Timișoara, in <b>Domașnea Cornea railway station</b> , the power supply junction box from the switch no.3/9 was hit by the locomotive EA 637, it hauling the passenger train Interregio no.1692 ((got by SNTFC CFR Călători SA).	iii	28.03.2019
9	02.04.2018	In the railway county București, in <b>Videle railway station</b> , in the running of the freight train no.21716-1 (got by the railway undertaking SNTFM „CFR Marfă” SA), all the axles of the locomotive EA 875 and one bogie of the first wagon derailed.	i	01.04.2019
10	04.04.2018	In the railway county Brașov, track section Brașov - Sighișoara (electrified double-track line), <b>between Racoș and Rupea railway stations</b> , on the track I, km 237+960, in the running of the freight train no.80311, got by the railway undertaking SC Grup Feroviar Român SA, one bogie of the 33rd wagon derailed.	i	02.04.2019
11	08.04.2018	In the railway county Craiova, on the <b>running line Vârciorova - Gura Văii</b> , km. 366+100, the winch from the wagons for the car transport, being in the track gauge, was hit by the plough of the locomotive of the passenger train regio no.9508 (got by SNTFC „CFR Călători” SA).	iii	27.03.2019
12	16.04.2018	In the railway county Craiova, in <b>Târgu Jiu railway station</b> , the locomotive EC 057 ran away (got by SNTFC „CFR Călători” SA), being stopped on the line II, starting with 11:00 o'clock, passing the route signal YIIP in stop position, it being on “red” position.	iii	23.03.2019
13	19.04.2018	In the railway county Timișoara, in <b>the railway station Păuliș</b> , the locomotive of the freight train no. 90966-1 (got by the railway undertaking RailForce SRL) passed the entry signal X in stop position, followed by the forcing of the first switch met on the route.	iii	15.05.2018
14	25.04.2018	In the railway county Cluj, track section Dej Călători - Beclean pe Someș, (electrified double-track line), in <b>Dej Triaj railway station</b> , Group A,	i	28.03.2019

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		in the running of the freight train no.42695-2 (got by the railway freight undertaking SNTFM „CFR Marfă” SA), the first bogie of the wagon no.31530070031-3, the 5th one after the locomotive, derailed in the running direction.		
15	20.04.2018	In the railway county Galați, in <b>Săhăteni railway station</b> , the first door of the 4th wagon after the locomotive, of the freight train no. 50436 (got by UNICOM TRANZIT SA), in the running direction, hit the reinforced concrete pillar SBC 45.	iii	07.03.2019
16	26.04.2018	In the railway county Timișoara, in <b>Aradu Nou railway station</b> , the passenger train no. 16172 (got by the railway undertaking SC „Regio Călători” SRL) passed the entry signal XZ in stop position.	iii	18.04.2019
17	04.05.2018	In the activity area of SC TMB „METROREX” SA București, track section Berceni–Pipera M2 (electrified double-track line), <b>between Piața Romană and Pipera metro stations</b> , a part detached from the train TEM 1317-2317 hit the infrastructure elements.	iii	04.04.2019
18	08.05.2018	In the railway county Timișoara, at the entry on the line 8 of <b>Simeria railway station</b> of the freight train no.80432-1, got by the railway freight undertaking Grup Feroviar Român SA, the second bogie, in the running direction, from the 20th wagon and the first bogie of the 21st wagon derailed	i	06.05.2019
19	23.05.2018	In the railway county Constanța, track section Fetești – Constanța (electrified double-track line), in <b>Valu lui Traian railway station</b> , in the running of the freight train no.80506-1, got by the railway freight undertaking Grup Feroviar Român, the first axle of the 9th wagon, in the running direction, derailed.	i	15.05.2019
20	24.05.2018	In the railway county Brașov, track section Brașov – Ploiești Vest (electrified double-track line), in <b>Predeal railway station</b> , during the shunting of a group of 9 wagons with the locomotive EA 386, got by the railway freight undertaking Unicom Tranzit, the vehicles runaway from the line no.2 of the railway station Predeal and ran on the track II of the railway station Azuga.	iii	20.05.2019
21	05.06.2018	In the railway station Brașov, non-interoperable track section Bartolomeu – Zărnești (non-electrified single-track section) managed by RC-CF Trans SRL Brașov, <b>between Bartolomeu and Cristian railway stations</b> , km.9+800, a fire burst into the multiple unit AMX 557, making together with the multiple unit AMX 289 the passenger train	i	30.05.2019

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		no.16331, got by the railway undertaking Regio Călători SRL Braşov.		
22	06.06.2018	In the railway county Cluj, in <b>Dej Triaj railway station</b> , in the running of the freight train no.41722, got by the railway undertaking SNTFM „CFR Marfă” SA, the last axle of the 29th wagon of the train derailed.	i	04.06.2019
23	14.06.2018	In the railway county Craiova, track section Filiaşi - Craiova, (electrified double-track line), in <b>Craiova railway station</b> , in the running of the freight train no.60524, got by the railway freight undertaking Tim Rail Cargo SRL, the second bogie of the wagon no.84535304149-2, the 15th after the locomotive derailed in the running direction.	i	13.06.2019
24	20.06.2018	In the railway county Cluj, track section Dej Călători - Beclean pe Someş, (electrified double-track line), in <b>Dej Triaj railway station</b> , Group A, in the running of the freight train no.42695, got by the railway freight undertaking SNTFM „CFR Marfă” SA, the first bogie of the wagon no. 31530670031-3, the 3rd one after the locomotive, derailed in the running direction.	i	06.06.2019
25	23.06.2018	In the railway county Craiova, track section Filiaşi – Târgu Jiu, in <b>Turceni railway station</b> , during the stabling of the freight train no.23642, hauled by the locomotive ED 050, got by the railway undertaking SNTFM „CFR Marfă” SA, three wagons of the train derailed.	i	13.06.2019
26	30.06.2018	In the railway county Craiova, track section Roşiori Nord - Videle, in <b>Roşiori Nord railway station</b> , during the stabling of the freight train no.60250, hauled by the locomotive EA 030, got by the railway undertaking SC LTE – Rail România SRL, four wagons of the train derailed.	i	28.06.2019
27	16.07.2018	In the railway county Craiova, in <b>Drobeta Turnu Severin railway station</b> , the freight train no. 89306 overran the shunting limit signal from the line no.7, hid by the group signal Y4-8, followed by the forcing of the switch no.27.	iii	23.03.2019
28	23.07.2018	In the activity field of SC TMB „METROREX” SA Bucureşti, track section Berceni–Pipera M2 (electrified double-track line), in <b>Aviatorilor metro station</b> , a part of the train TEM 1320 (anti-rolling bar from the bogie no. 2) hit the infrastructure elements.	iii	04.04.2019
29	05.08.2018	In the railway county Cluj, in <b>Aleşd railway station Aleşd</b> , when the freight train no.32101 (got by the railway undertaking SNTFM „CFR Marfă” SA), crossed over the switch no. R46, all the axles	i	18.06.2019

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		of the first wagon and the both axles of the first bogie from the second wagon derailed.		
30	09.08.2018	In the railway county Cluj, track section Sărățel – Deda, <b>between Râpa de Jos and Deda railway stations</b> , the freight train no. 80609, hauled by the locomotive EA 817, got by the railway undertaking Grup Feroviar Român SA, exceeded the maximum speed accepted by the line.	iii	05.08.2019
31	12.08.2018	In the railway county Craiova, in the running of the freight train no.80315, got by the railway undertaking Grup Feroviar Român SA, having order for stop in the railway station Malu Mare continued to run, passed the signal X2 in stop position, having the position „STOP without passing the signal in stop position” and derailed <b>on the track I Malu Mare – Banu Mărăcine</b> , on the viaduct from km 200+306.	i	08.08.2019
32	25.08.2018	In the railway county București, track section Ploiești Sud – Buzău (electrified double-track line), <b>between Ploiești Est and Valea Călugărească railway stations</b> , a fire burst into the locomotive EA 833, hauling the freight train no.83355, got by the railway undertaking SNTFM „CFR Marfă” SA	i	20.08.2019
33	09.09.2018	In the railway county Iași, in <b>Bârlad railway station</b> , the passenger train IR 1661, got by the railway undertaking SNTFC „CFR Călători” SA, did not stop in the railway station and passed the exit signal XII in stop position, having the position „STOP without passing the signal in stop position”.	iii	Investigation in process
34	11.09.2018	In the railway county Timișoara, in <b>Glogovăț railway station</b> , in the running of the freight train no.46841-2, got by the railway undertaking Deutsche Bahn Cargo România, the switch no. 1 was forced.	iii	14.08.2019
35	21.09.2018	In the railway county București, <b>between Chitila and Chiajna railway stations</b> track II, km 1+200, in the running of the freight train no.30610-1 (got by the railway undertaking Deutsche Bahn Cargo Romania), the first five axles of the locomotive EA2002 and the first axle from the first bogie of the first wagon derailed in the running direction.	i	Investigation in process
36	27.09.2018	In the railway county Cluj, track section Dej Călători - Beclean pe Someș, (electrified double-track line), in <b>Dej Triaj railway station</b> , on the entry route at the line 7A, switch no.37, in the running of the freight train no.42695, got by the railway freight undertaking SNTFM „CFR Marfă” SA, the first bogie of the wagon no.31530670097-	i	Investigation in process



No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		4, the 13th one after the locomotive, derailed in the train running direction		
37	01.10.2018	In the railway county Craiova, in <b>Mihăiești railway station</b> , end X, the route for the passenger train no. 9006, to the railway station Măldăeni, was wrong	iii	14.08.2019
38	04.10.2018	In the railway county Craiova, in <b>the railway station Ploșoru</b> , the route of the passenger train Regio no.2855, to the railway station Rovinari was wrong	iii	14.08.2019
39	07.11.2018	In the railway county Craiova, in <b>Roșiori Nord railway station</b> , on the switch no.31, in the running of the passenger train no.1597 (got by the railway undertaking SNFTC „CFR Călători” SA), the first bogie of the second wagon derailed in the running direction.	i	Investigation in process
40	12.11.2018	In the railway county Timișoara, in <b>Bănița railway station</b> , the entry signal YIII was passed in stop position, followed by the forcing of the first switch met along the route by the locomotive of the freight train no.30562 (got by the railway undertaking SC., Deutsche Bahn Cargo Romania” SRL).	iii	Investigation in process
41	11.11.2018	In the railway county Timișoara, track section Arad - Simeria (electrified double – track line), on <b>the running line between Ilteu – Zam railway stations</b> , track II, km.527+860, parts of the railway vehicles fell, leading to the derailment of both axles from the first bogie (in the running direction) of the wagon no.31817853504-7, the 13th one of the freight train no.70926 (got by the railway undertaking SC MMV Rail România SA).	iii	Investigation in process
42	16.11.2018	In the railway county Brașov, track section Brașov – Sighișoara, electrified double-track line, <b>between Beia and Mureni railway stations</b> , km. 268+500, track I, in the running of the breakdown train no.38321 hauled with the locomotive EA 573, the first two axles of the breakdown crane 125 Tf, got by CNCF „CFR” SA, derailed in the running direction.	i	Investigation in process
43	18.11.2018	In the railway county Brașov, track section Deda – Târgu Mureș, nonelectrified single-track line, km 277+500, <b>between Dumbrăvioara and Târgu Mureș Nord railway stations</b> , a fire burst into the locomotive DA 759 hauling the passenger train Regio nr.4511, got by the railway undertaking SNTFC „CFR Călători” SA.	i	Investigation in process
44	23.11.2018	In the railway county Iași, <b>between Itești and Bacău railway stations</b> , track II, km 309+627, in the running of the freight train no.61716 (got by the	i	Investigation in process

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		railway undertaking SNTFM „CFR Marfă” SA), the first bogie of the 34th wagon derailed in the running direction.		
45	30.11.2018	In the railway county Constanța, track section București Nord – Ciulnița (electrified double-track line), <b>in Dragoș Vodă railway station</b> , between km 95+680 and km 95+750, the automatic brake-rod adjusters SAB, detached from the fastening supports of the axles no. 4 and 5 of the locomotive EA 122, from the composition of the passenger train Interregio no.1583 (got by the railway undertaking SNTFC „CFR Călători” SA), hit the components of the switches no.1, 7 and 13.	iii	Investigation in process
46	05.12.2018	In the railway county Timișoara, in <b>Glogovăț railway station</b> , the exit route of the passenger train no.2028 (got by the railway undertaking SNTFC „CFR Călători” SA) was wrong.	iii	Investigation in process
47	11.12.2018	In the railway county Galați, in <b>Vădeni railway station</b> , at the reception of the passenger train no.1573, got by the railway undertaking SNTFC „CFR Călători” SA, with calling-on signal on the line 4, was routed on the line 5 occupied by the train 1772, got by the same railway undertaking.	iii	Investigation in process
48	18.12.2018	In the railway county Timișoara, in the running of the freight train no.L79706 (got by the railway undertaking Grup Feroviar Român SA), <b>between Utvinișu Nou and Sântana railway stations</b> , at the level crossing provided with full barrier, km.12+547, a minibus was hit and damaged, and driver of the minibus was slightly injured.	i	Investigation in process
49	22.12.2018	In the railway county Timișoara, running line Grădinari Caraș – Berzovia, (non-electrified single-track line), <b>between Doclin and Tirol railway stations</b> , km.13+300, in the running of the freight train no.69498S (got by the railway undertaking SC Tim Rail Cargo SRL), the last four wagons of the train derailed.	I	Investigation in process
50	23.12.2018	In the railway county Timișoara, track section Petrosian - Siberia (electrified double-track line), <b>between railway stations Subacetate and Beiste</b> , on the track I, (track II closed on the 30th October 2018 for rehabilitations), in the running of the passenger train inter regio no.1821 (got by the railway undertaking SNTFC „CFR Călători” SA), the last three wagons derailed and one person was injured.	i	Investigation in process
51	26.12.2018	In the railway county Cluj, track section Dej – Deda (electrified single-track line), <b>between Monor Gledin and Râpa de Jos railway stations</b> , km	i	Investigation in process

No	Date of occurrence	Presentation	Legal basis of the investigation <sup>(1)</sup>	Date of finishing
		37+100, in the running of the freight train no.44505 (got by the railway undertaking SNTFM „CFR Marfă” SA), the first axle of the hauling locomotive EA 563, derailed in the running direction.		

(1) **Legal basis of the investigation:** i= According to the Safety Directive, ii= Upon the national legal basis (that covers the possible areas excluded by the art.2, paragraph 2 of the Safety Directive), iii= Optional – other criteria (National norms/regulations, to which the Safety Directive does not refer).

### 3.3 Researches (or safety surveys) finished or ordered in 2018

#### Surveys ordered in 2017 and finished in 2018

Order date	Study name (classification type, localization)	Legal basis of the investigation <sup>(1)</sup>	Complementary data
26.07.2017	Technical expertise of the breakage section of the broken axle (metalographic determinations for the chemical composition and structure of the material the axle is made of and physic-mechanic tests) from the wagon no.31537991154-0, involved in the railway accident happened on the 15th July 2017, at 06:40 o'clock, in the railway county Constanța, track section Făurei - Fetești (electrified double-track line), in Țândărei railway station, in the running of the freight train no.61733 (got by the railway undertaking SNTFM „CFR Marfă” SA), consisting in the derailment and overturning of two wagons (the 29th and the 30th ones in the running direction).	i	Finished 26.06.2018

(1) **Legal basis of the investigation:** i= According to the Safety Directive, ii= Upon the national legal basis (that covers the possible areas excluded by the art.2, paragraph 2 of the Safety Directive), iii= Optional – other criteria (National norms/regulations, to which the Safety Directive does not refer).

### Surveys ordered in 2018 and finished in 2018

Order date	Study name (classification type, localization)	Legal basis of the investigation <sup>(1)</sup>	Complementary data
-	-	-	-

### Surveys ordered in 2018 rested in process

Order date	Study name (classification type, localization)	Legal basis of the investigation <sup>(1)</sup>	Complementary data
		-	-

(1) **Legal basis of the investigation:** i= According to the Safety Directive, ii= Upon the national legal basis (that covers the possible areas excluded by the art.2, paragraph 2 of the Safety Directive), iii= Optional – other criteria (National norms/regulations, to which the Safety Directive does not refer).

## 3.4 Summary of the investigations finished and closed in 2018

During 2018, 37 investigations were finished and closed, from which 30 were open in 2017, the rest of 7 being open in 2018.

Below there is presented a summary of those 37 investigation reports finished and closed in 2018.

**3.4.1** The railway accident happened on the **7th February 2017**, at about 16:10 o'clock, in the railway county Timișoara, track section **Sânicolau Mare – Cenad** (non-interoperable track section managed by RC-CF Trans SRL Brașov), consisted in the derailment of all axles from the multiple unit AMX 526 and of the axles 1 and 3, in the running direction, of the multiple unit trailer no.57-326-9 from the passenger train no.14389 (got by the railway undertaking SC RegioTrans SRL Brașov).

The investigation report was ended on the 17th October 2018.

#### Direct causes

The fall between the rails of the left wheel (running on the inner rail of the curve), from the first axle (guiding axle) of the train, following the unsuitable condition of the track on the curve from km 66+450 of the running line Sânicolau Mare – Cenad. It happened because the increase of the gauge value over the accepted tolerances, following the lateral movement of the outside rail of the curve under the action of the dynamic forces transmitted to the track by the running rolling stock.

#### Contributing factors

- fastening of the outside rail of the curve on the ends of four consecutive wooden sleepers existing at the derailment place, it making possible under the dynamic forces generated by the rolling stock in running, the gauge over widening over the accepted operation tolerances;
- non-fastening of the inside rail of the curve on the ends of three consecutive wooden sleepers existing at the derailment place, it making possible under the dynamic forces generated by the rolling stock in running, the gauge over widening over the accepted operation tolerances;
- unsuitable technical condition of the wooden sleepers existing very close to the, point 0" (point of derailment), that under the action of the dynamic forces transmitted by the rolling stock to the fastening elements of the metallic plates, could not keep the gauge value between the tolerances;
- non-supplying of the Line District Sânicolau Mare with normal wooden sleepers (critical railway materials included in the class of risk IA), necessary to be urgently replaced I, according to

the last records of the unsuitable sleepers made by the district inspector Sânnicolau Mare (October 2015, respectively October 2016);

- insufficient human resources for the performance of the railway infrastructure maintenance in the Line District Sânnicolau Mare.

#### **Underlying causes**

- infringement of the provisions from art.25, paragraphs (2) and (4) from „Instruction of norms and tolerances for the line construction and maintenance – lines with standard gauge no.314/1989“, concerning the failures that impose the replacement of the wooden sleepers and non-keeping within the line of the unsuitable sleepers;
- infringement of the provisions of point 4.1, from Chapter 4 „Norms of manpower and material consumption“, from „Instruction for the line maintenance no.300/1982” concerning the assurance of the manpower norm for the current hand maintenance;
- non-application of the provisions from Sheet nr. 11 and Sheet no.12 from the Instruction 305/1997, concerning the establishment of terms and order for the track inspection”.

#### **Root causes**

- non-application of the provisions from the Instruction for the line maintenance no. 300/1982, document associated to the process procedure code PP-63 „ Railway infrastructure maintenance”, part of the safety management system got by RC – CF Trans SRL Braşov, concerning the quarterly inspection of the lines with the track trolley/gauge measure and the sizing of the staff from the subunits for the line maintenance, in relation to the works, fact confirmed by the under sizing of the staff from the line district Sânnicolau Mare;
- non-inclusion in the „Flow diagram” of the process „Track diagnosis and work records”, from the process procedure, code PP-63 „ Railway infrastructure maintenance”, of the operations for the periodical inspections of the track for the positions of track section head and deputy of the track section head, stipulated in the Instruction for the establishment of terms and order for the track inspections” no. 305/1997 (Sheets no.11 and no.12), document associated to this procedure. The above-mentioned positions are not included either in, List of jobs” of the infrastructure manager.

#### **Additional remarks**

During the investigation, the investigation commission found out also the next non-conformities, without relevance for the conclusions on the causes:

In 2017, until the occurrence of the accident, the manager of the railway non-interoperable infrastructure SC RC-CF Trans SRL Braşov, in the line district Sânnicolau Mare, used permanently, for the periodical technical inspection of the track, staff with responsibilities in the traffic safety without authorization and medical and psychological approval, according to the specific regulations in force, for this activity.

#### **Measures taken**

Soon after the verbal notification of the accident, the running line Sânnicolau Mare – Cenad was closed. It was opened on the 22nd of April 2017, after the track consolidation (change of sleepers and ensuring the line geometry) in the curved area of the track section Sânnicolau Mare - Cenad.

#### **Safety recommendations**

Taking into account that during the investigation, one identified some non-conformities in the application of the procedures covering the requirements of the safety management system, that generated and can forwards generate railway accidents/incidents, Romanian Railway Investigation Agency - AGIFER recommends ASFR to be sure that the railway infrastructure manager SC RC-CF Trans SRL Braşov, makes a right identification and analysis of the risks generated by the non-supply of the materials and human resources, necessary to perform the maintenance of the railway infrastructure and to monitor those risks in accordance with the provisions of the Regulations (EU) no. 1078/2012.

**3.4.2** The railway accident happened on the **15th February 2017**, at about 06:26 o'clock, in the running of the train no. 50477 got by the railway undertaking SC UNICOM TRANZIT SA.in the

railway county Cluj, track section Beclean pe Someş – Dej Călători, km.0+688, between **Dej Triaj** and **Dej Călători** railway stations (electrified single-track line), consisted in the derailment of the first bogie of the wagon no.84535489625-6 Eacs type, the 4th one from the locomotive EA727, in the running direction.

The investigation report was ended on the 12th February 2018.

### **Direct causes**

The overclimbing of the gauge face of the outside rail of the curve by the leading wheel (right one in the train running direction) from the wagon no.84535489625-6, because the increase of the ratio between the guiding force and the load acting on this wheel, so exceeding the stability limit at derailment.

The increase of the ratio between the guiding force and the load acting on the leading wheel happened because the important load transfer of the right wheel from the guiding axle and increase of the lateral force (guiding one) on this wheel.

### **Contributing factors**

Load unevenly disposed in the wagon, provided by the load ratio between the wheels of 2,56 to 1, that was over the value of 1,25 to 1 accepted in operation;

Exceeding of the values of the tolerances accepted in operation for the track geometry, it being amplified by the dynamic lateral movements of the wagon.

### **Underlying causes**

Infringement by the loader of the loading rules established through the *Loading Method 1.11.1* from ANNEX II RIV - Book 2, concerning the loading way of the light metallic wastes;

Infringement of the provisions *point. 3.3 Load disposal* from Annex II RIV-Book 1, concerning the maximum ratio accepted between the loads of the wheels from the same axle;

Infringement by RU of the provisions from the Agreement concluded with the Forwarder, concerning the control of the load disposal in the derailed wagon;

Infringement by RU of the provisions from art. 34 (2) of the Transport Regulations, concerning the acceptance for transport of the goods, only if the special conditions from the legal disposals are met;

Infringement of the provisions of art.7B, point 1 from *Instruction of norms and tolerances for the track construction and maintenance-lines with standard gauges no.314/1989* concerning the positive tolerances of the track, for the values of the close versines.

### **Root causes**

RU did not establish for its staff the responsibilities concerning the way to load the good type swarf (light metallic wastes) and of the responsibilities concerning the delivery – reception of the transports of good type swarf, being infringed in a such way the provisions of point 1 from Annex 3, from the Law no. 55/2006 for the railway safety;

The infrastructure manager did not establish for its own staff the responsibilities concerning the control of the track geometry and the way to deal with the non-conformities found out during this control, being infringed in a such way the provisions of point 1 from Annex 3, of the *Law no. 55/2006 for the railway safety*;

Non-application of the provisions of the Instruction for the line maintenance no.300/2003, document associated to the operational procedure code PO SMS 0-4.07 „*Compliance with the technical specifications, standards and requirements relevant for the whole life time of the lines in the maintenance process*”, part of the safety management system of CNCF ”CFR” SA, concerning the size of the staff from the sub-units for the line maintenance in relation to the total of works.

### **Safety recommendations**

(1) The investigation commission considers that the Safety Management System - SMS of SC UNICOM TRANZIT SA was not drafted in accordance with the provisions of the Law 55/2006 for the railway safety. So, the derailment of the wagon no.84535489625-6 happened because the lack of a written procedure within SMS of SC UNICOM TRANZIT SA, for the establishment of the

responsibilities for its own staff, concerning the acceptance for transport of wagons loaded with light metallic wastes, in bulk;

The investigation commission also found out that in the Register for the record of its own dangers of SC UNICOM TRANZIT SA, one did not identify the danger generated by the infringement of the norms on the acceptance for transport of wagons loaded with light metallic wastes in bulk.

In this regard, the investigation commission addresses to Romanian Railway Safety Authority the next safety recommendations:

to ask SC UNICOM TRANZIT SA the revision of the safety management system and making a risk analysis for the associated dangers for the situation of acceptance for transport of wagons loaded with light metallic wastes in bulk, that do not comply with the loading provisions;

(2) The investigation commission considers that the SMS of CNCF „CFR” SA was not drafted in accordance with the provisions of Law 55/2006 for the railway safety. So, the derailment of the wagon no.84535489625-6 happened because the lack of a written procedure within SMS of CNCF „CFR” SA, for the establishment of the responsibilities for its own staff concerning the control of the track geometry and the way to deal with the non-conformities found out during this control;

The investigation commission also found out that in the Register for the record of its own dangers of the railway county Cluj, one does not identify the danger generated by the infringement of the norms for the quality of the track geometry.

In this regard, the investigation commission addresses Romanian Railway Safety Authority the next safety recommendations:

to ask CNCF „CFR” SA the revision the safety management system and making a risk analysis concerning the associated dangers for the situation of exceeding the tolerances specific to the track geometry;

**3.4.3** The railway incident happened on **2nd March 2017**, at 00:50 o'clock, in the railway county Timișoara, track section Petroșani–Simeria (electrified double-track line), in **Călan** railway station, km 12+700, consisted in the hitting of the track inductor of 1000/2000 Hz afferent to the entry signal Y, by the inductor of the locomotive EA 272, hauling the train no.59420A (got by the railway undertaking SC UNICOM TRANZIT SA).

The investigation report was finished on the 26th February 2018.

#### **Direct causes**

The entry in the structure clearance for the elements of the railway equipments, of the inductor from the driving cab II of the locomotive EA 272.

#### **Contributing factors**

Breakage of the screws for the fastening of the guard connection on which the inductor from the axle no. 6, left side, was fixed (axle no.1, front right side, in the train running direction).

#### **Underlying causes**

None.

#### **Root causes**

None.

#### **Additional remarks without relevance for the incident causes**

During the investigation of the incident, there were identified some non-conformities concerning the activity of the crew from the locomotive EA 272, from the 1st March 2017, without relevance for the incident causes:

- the provisions of the Instruction for the activity of the locomotive crew no.201/2007, art.9(1), letter o) were not met, all the operations stipulated by the specific instructions for the operation of the information and safety systems, fitted in the locomotive, not being performed, through the not filling by the locomotive crew of the data for the person identification and of the hauled trains.
- the provisions of the Instruction for the activity of the locomotive crew no.201/2007, art.197, letter a) were not met, that is in the railway station Călan Băi, the driver did not hold the front driving

cab (right side of the running direction) at the exit of the light locomotive from the main line II for its entry on the line 1 at the group of wagons.

### **Safety recommendations**

In case of the railway incident happened in the running of the freight train no.59420A, from the 2nd March 2017, one found out that the entry, in the structure clearance for the elements of the railway equipments, of the inductor from the driving cab II of the locomotive, hauling the train, happened following the breakage of the screws for the fastening of the guard connection from the axle no.6 back left side (axle no.1, front right side, in the running direction of the train) from the locomotive EA 272.

Taking into account these found out, as well as that the investigated case was identified at other railway undertakings too (as it was presented in the chapter *C.5.6. Previous similar events*) the investigation commission considers necessary to issue the next safety recommendation:

Romanian Railway Safety Authority – ASFR shall take care that the entities in charge with the maintenance of the electric locomotives type LE revise the technical procedures/specifications, which are reference documents for the maintenance job, in order to identify solutions that cover the risk generated by the breakage of the screws for the fastening of the guard connections at the electric locomotive.

**3.4.4** The railway accident happened on the **28th February 2017**, at 15:35 o'clock, in the railway county Cluj, track section Halmeu – Satu Mare ( non-electrified single-track line), km 807+730, between **Halmeu and Porumbesti** railway stations, consisted in the derailment of both axles from the first bogie of the diesel multiple unit ADH 1421, in its running direction, it running like passenger train no.4408 ( got by the railway undertaking CFR CALATORI SA).

The investigation report was finished on the 12th February 2018.

### **Direct causes**

The overclimbing of the gauge face of the left rail by the left wheel in the running direction of the powered unit no.1461, following both the increase of the ratio between the guiding force and the load on this wheel and as well as of the relative decrease of the contact angle inclination of the profiles against the rail, exceeding in a such way the stability limit at the derailment.

Increase of the ratio between the guiding force and the load acting on the leading wheel, respectively the relative decrease of the contact angle inclination of the wheel flange against the rail, happened because the strong load transfer of the left wheel from the first axle, the increase of the lateral force (guiding one) on this wheel and reclining of the axle against the running track.

### **Contributing factors**

- dynamic impacts generated by the broken stone put on the running surface of the right rail, on the light vehicle running with a speed of 68 km/h;
- load transfer of the first left wheel, happened because the breakage of the air cushion from the suspension and reclining of the wagon body, this breakage due to the impacts generated by the running of the right wheel on the broken stone put on running surface of the rail;

Taking into account the total of factors that generated the event occurrence and that one of them resulted from the action of third individuals, this event is re-classified in accordance with the art.10 ,, the facts of third individuals or legal persons that put in danger the railway safety, that led to interruptions of railway traffic, destruction and/or the theft of parts or materials of the vehicles or railway infrastructure.

### **Underlying causes**

None

### **Root causes**

None

### **Safety recommendations**



Taking into account the factors contributing to the event occurrence, the factors based on causes external to the railway system, the investigation commission does not consider necessary to issue any safety recommendations.

**3.4.5** The railway accident happened on the **15th March 2017**, at about 09:35 o'clock, in the running of the passenger train Regio no. 4313, got by the railway passenger undertaking SNTFC "CFR Călători" SA in the railway county Cluj, track section Satu Mare – Baia Mare (non-electrified single-track line), km 52+667, between the railway stations **Buşag and Baia Mare**, consisted in the derailment of the rear axle of the trailing car LVS 538, in the running direction.

The investigation report was finished on the 13th March 2018.

#### **Direct causes**

Direct cause of the accident is the flange wheel face of the rear right overclimbed the gauge face of the rail, having like reference the train running direction, from the trailing car LVS 538, following the increase of the ratio between the guiding force and the load acting on this wheel, so exceeding the stability limit at derailment.

Increase of the ratio between the guiding force and the load acting on the rear right wheel happened because the serious load transfer of the wheel, generated by a force acting bottom up on the body of the light vehicle, of the diesel tank that detached from the vehicle, fell on the track bed and became an obstacle for the vehicle running.

#### **Contributing factors**

Non-performance of the periodical technical checking during the planned inspection of the screws from the support for the fastening of the diesel tank of the trailing car LVS.

#### **Underlying causes**

None.

#### **Root cause**

The root cause of the accident is the lack of a technical regulation that stipulate the periodical checking of the elements for the fastening of the tank from the trailing car LVS, during the planned inspections.

#### **Safety recommendations**

The investigation commission considers that the derailment of the trailing car LVS 538 happened because the lack of a written instruction within the Technical Specification COD: ST 11-2005, through which the responsibilities for the checking of the fastening supports from the trailing car type LVS during the planned inspections be assigned.

Taking into account the provisions from art. 4(3) of the Law no.55 from the 16<sup>th</sup> March 2006 for the railway safety, that stipulate that the responsibility for the safety operation of the railway system and for the control of the associated risks is in charge of the railway undertakings, that have to apply the measures necessary for the risk control, if case in cooperation, the investigation commission considers necessary to issue a safety recommendations for Romanian Railway Safety Authority – ASFR, as follows:

ASFR ask the railway passenger undertakings that got in their stock trailing cars type LVS, the performance of a risk analysis for the associated dangers, in case of breakage of the screws for the fastening of the diesel tanks, from this type of railway vehicles.

**3.4.6** The railway incident happened on the **27th March 2017**, at 12:50 o'clock, in the railway county Iasi, track section Iasi - Paşcani (electrified double-track line), in **Târgu Frumos** railway station, consisting in the performing the wrong route over the exit of the train R no. 5524, by the movements inspector on duty (the train got by the railway undertaking SNTFC „CFR Călători” SA).

The investigation report was finished on the 03rd April 2018.

#### **Direct causes**

The direct cause of the incident is a human error appeared in the operation of the passenger train Regio nr.5524, consisting in the setting of the wrong route for the train stabling in the railway station Târgu Frumos.

### **Contributing factors**

The station manager did not monitor the railway operation performed by the movements inspector IDM, during the maintenance, task stipulated in the working procedure and approved by the organization management (telegram no.106/22.02.2017).

Change of the line for the train stabling, stipulated in the timetable for arrival, departure and stabling of the railway station, without applying the request procedure for the appearance of a such need.

Wrong setting of the entry route on the line 2 of the railway station, considered to be necessary for the operation of the train no.5524, in the conditions of non finishing of the procedure for the line opening, closed before for complex works of its railway infrastructure maintenance.

### **Underlying causes**

Violation of the provisions from the Regulations for the trains running and shunting of the railway vehicles, no.005/2005, art.159 paragraph (8) and art.160, regarding the change of the line for the train reception;

Violation of the provisions from the Regulations for the trains running and shunting of the railway vehicles, no.005/2005, art.327, paragraph (2), regarding the opening of the lines from the railway station.

Violation of the provisions from the working procedure (telegram no.106/22.02.2017, point 3. letter a), regarding the monitoring of the activity of the movement staff during putting out of service of the switches and of their point machine.

### **Root causes**

None.

### **Measures taken**

The nonconformities found in the activity of the working, management and control staff were analyzed and handled, from administrative point of view, in the Railway County Iași, soon after the incident occurrence.

Additionally, analyzing operatively the case, there was asked the heads of the traffic controllers shall not give the approval of leaving the subunits to the managers of the railway stations, during the works of monitoring of the activity of the subordinated staff.

### **Safety recommendations**

In the operation activity, the trains running and stop on the lines of a railway station is very accurately established through the technical plan for the railway station operation. Any deviation from this activity of operation can be done by the human operator through a specific procedure stipulated in the *Regulations for the trains running and shunting of the railway vehicles no.005/2005*, that needs a request of the initiator (IDM) and approval of the superiors in the operation activity (operator RC). The human operator (IDM) made the decision to violate the specific procedure, ignoring its content.

There is also a specific procedure for the railway traffic safety and if a line is closed from different reasons, imposed by the maintenance or by its technical condition, that imposes a chain of operations for checking and ensuring that the line is suitable for operation. In this situation the human factor (IDM), without no justification, ignored the application of the provisions from the procedures for traffic safety in the operation activity.

We mention that the human factor had a suitable professional training, he knowing the way to apply the procedures of safety traffic in operation activity. The fact that the human factor did not apply the provisions of those two specific procedures of traffic safety in operation activity, can generated the idea that in order to make easy its task, he does not apply them, making own working routines and methods that were not remarked by the organization staff with tasks in training, switching over and control in the operation activity.

Taking into account that the application of the procedures of traffic safety, stipulated in the codes of good practice proved to be sure in the railway operation, being very important the compliance with their content of the human operators, and for the prevention of some incidents or accidents with similar causes, that can have like consequences victims and damages at the railway equipments and vehicles, AGIFER recommends ASFR:

Shall analyze the possibility of training of CNCF CFR SA staff, capable to identify the creation of working routines and the dissemination of those wrong habits in the advising, training and control activities.

**3.4.7** The railway serious accident from the **8th April 2017**, at 14:30 o'clock, in the railway county Timișoara, track section Petroșani - Simeria (electrified double-track line), between **Bănița and Merișor** railway stations, on the track I, km 62+940, consisted in the derailment of the hauling locomotive EA 759 and of the first 14 of the freight train no. 50457 (got by the railway undertaking SC UNICOM TRANZIT SA), that led to the death of the locomotive crew (driver and driver's assistant).

The investigation report was finished on the 3rd April 2018.

#### **Direct causes**

The direct cause of the accident was the very important increase of the lateral forces acting on the locomotive wheels, it leading to the exceeding of the derailment stability limit. It happened because, the running on a curve, the train speed (92 km/h) exceeded with 130% the maximum speed on the track section (40 km/h).

The increase of the train speed happened following some human errors, following which the angle air cock from the first wagon was on „off”, the general air pipe being interrupted, and the automatic braking of the train could not assure its braking.

#### **Contributing factors**

- the physical condition of the locomotive staff was affected by:
- consumption of alcoholic drinks during the working time;
- fatigue cumulated between leaving the home and the accident occurrence, this fatigue present in case of the driver that was 67 years old.

#### **Underlying causes**

(1) Infringement of the provisions of art.1 from the Order of Minister of Transports and Telecommunications no.855/1986 concerning the prohibition for the staff that are working in transport field to introduce in the units and to drink alcoholic drinks, as well as of the provisions of art.12, paragraph (1), letter b), from the Instructions for the activity of the locomotive crew no.201/2007, concerning the prohibition to transport and/or drink during the working time alcoholic drinks that can reduce the driving capacity of the locomotive crew.

(2) Infringement of the provisions of art.2 from Norms approved by Order of Minister of Transports no.256/2013, concerning the maximum continuous working time accepted in the locomotive for the locomotive crew, in complete team.

(3) Infringement of the provisions of art.10 from the Norms approved by the Order of Minister of Transports no.256/2013, according which the railway undertaking requests, 60 minutes at least before the end of the effective driving time of the locomotive, the operative management of the infrastructure manager or of the administrator to stop the train for the shift exchange.

(4) Infringement of the provisions of art.125, paragraph (1) from the Instructions for the activity of the locomotive crew no.201/2007 concerning the strict compliance with the running speeds.

(5) Infringement of the provisions of art.75, paragraph (5) from the Regulations for hauling and braking no.006/2005, with reference to the way to use the train braking on track sections with slope over 15‰.

(6) Infringement of the provisions of art.70, paragraph (14) from the Instructions for the activity of the locomotive crew no.201/2007 concerning the prohibition to block the release valve of the locomotive brake cylinders.

### Root causes

Infringement of the provisions of point 5.14, letter h.2 and of point 5.16 from the Operational procedure code: POSF – 37, part of the safety management system developed by the railway undertaking SC UNICOM TRANZIT SA, concerning:

- the maximum limit of the time resulted from the summing of the working time during the train stop with the working time during the effective locomotive driving;
- sending of operative disposals for the adjustment of the running program, so the train crew on duty or taking rest outside the home to comply with the safety conditions imposed by the Norms approved through the Order of Minister of Transports no.256/2013.

### Additional remarks

(1) From the analysis of the running of the freight train no.50457, from the register records and from the minutes for the reading and interpretation of the data supplied by the speed recorder, as well as from the statements of the exterior station movements inspector from the railway station Petroșani, resulted that the freight train, that had, according to the working timetable, stop in the railway station Petroșani, where the driver had to be handed with the running order with the speed restrictions, was recorded in the register records with stop in the railway station, between the hours 14:00 – 14:02. Actually, the train did not stop, passing through the railway station Petroșani without the driver be handed over with the running order. It was possible because the infringement of the next provisions of the Regulations for the train running and shunting of the railway vehicles no.005, approved through the Order of Minister of Transports, Constructions and Tourism no.1816/2005:

- art.175, paragraph (1), concerning the reception in the railway station of the freight trains with the exit signal on danger. Actually, the train was received with the exit signal on clear indication. It was found following the reading and interpretation of the data supplied by the speed recorder, the inductor 1000 Hz of the entry light signal not being active and so not being necessary either the operation of the button ATENTION of the equipment INDUSI from the locomotive;
- art.207, letter g, concerning the running of the trains upon automatic section block, through which the disposing station movements inspector had to be sure that the train stabled. Actually, the disposing station movements inspector and the local one acted upon intuition, supposing that, taking into account the train length, the length of the stabling line and the time for the passing of the train through the station, the train could have the time necessary to stop;
- art.155, paragraph (1), letter a concerning the posting of the movements inspector when the train entered the station;
- art.207, letter f concerning the reception and the visual inspection of the train up to its stabling, by the movements inspector;
- point 34 from the Annex 1 concerning the handing of the running order for the driver notification about of the speed restrictions.

(2) Infringement of the provisions of art.5, paragraphs (2) and (5), letter a, chapter III from the Annex 2 of the Regulations for the train running and shunting of the railway vehicles - no.005/2005 concerning the duties of the movements inspector, concerning the filling and the handling of the route sheet when at the work start of the locomotive crew in the railway station, that is he did not fill the hour and the minute of checking and coming of the locomotive crew at the work, leaving to him the filling of the route sheet.

(3) Infringement of the provisions of art.9, paragraph (1), letter o from the Instructions for the activity of the locomotive crew no.201/2007, concerning the obligation of the locomotive crew to perform all the operations stipulated by the specific instructions for the operation of the softs and of the systems for the traffic safety, uploaded on-board, that is the locomotive crew did not input their identification data and the data of the hauled train.

(4) Infringement of the provisions of art.15, paragraph (1), letter c and of art.19, paragraph (1), letter d, chapter II from the Annex 1 of the Instructions for the activity of the locomotive crew no.201/2007, concerning the duties of the locomotive crew to fill the route sheet, that is they did not fill the hour and the minute of the delivery or previous stabling of the locomotive, and after the arrival in the railway station Târgu Jiu they did not fill the hour of the departure from the station and other stops of the train.

(5) The printed form Locomotive route sheet, provided by SC UNICOM TRANZIT SA to its own locomotive staff, does not comply with the form approved through the art.1, paragraph (2) from the Annex 1 of the Instructions for the activity of the locomotive crew, no.201, where it is stipulated that, the route sheet form is unique for all railway undertakings, the model being presented in the annex. The route sheet form provided by the railway undertaking has not all the columns numbered, although the regulations for the filling of the locomotive route sheet make clear reference at the number of the column.

#### **Measures taken**

In addition to the Safety Management System, the railway undertaking, SC UNICOM TRANZIT SA, bought a soft for the monitoring of the locomotive activity, called „FERODATA”, when the accident happened the soft was in testing process. For the implementation of this soft, the railway undertaking drafted an operational procedure code PO-07 „Implementation and capitalization of the soft FERODATA”, in force from the 14th July 2017.

The soft „FERODATA” has two parts:

- Operation of the fleet and the progress of the running program;
- Maintenance of the locomotive stock.

Within the part „operation of the fleet and the progress of the running program” one can do „continuous monitoring of the working time (both cumulated and splitted in driving time/ operation time) for the locomotive crew/train crew”. The soft offers the facility to see the working time of each locomotive crew/train crew, with the comparative presentation on a time bar, of the driving hours with the hours for operation during the stop, as well as of the maximum accepted work for single driving or complete crew.

#### **Safety recommendations**

On the 8th April 2017, at 14:30 o'clock, in the railway county Timișoara, track section Petroșani - Simeria (electrified double-track line), between the railway stations Bănița and Merișor, on the track I, km 62+940, in the running of the freight train no. 50457 got by the railway undertaking SC UNICOM TRANZIT SA, the hauling locomotive EA 759 and the first 14 wagons derailed. Following this serious railway accident led to the death of the locomotive crew (driver and driver's assistant).

Following the investigation, the investigation commission established that the railway serious accident happened following a human error, it being favoured by the physical condition of the locomotive crew, affected by:

- consumption of alcoholic drinks during the working time;
- fatigue accumulated during the time between the leaving of the home and the accident occurrence, this fatigue present in case of the driver that was 67 years old.

Taking into account the findings, the investigation commission considers necessary to issue the next safety recommendation:

Romanian Railway Safety Authority – ASFR shall take care that the railway undertaking SC UNICOM TRANZIT SA revise its own safety management system, so, applying all its own procedures, reduce the risks generated by the unsuitable physical condition of the locomotive staff.

**3.4.8** The railway accident happened in the running of the train no.28261-2 (breakdown train) got by the public railway infrastructure administrator CNCF „CFR” SA, on the **15th April 2017**, at about 11:22 o'clock, in the railway county Brașov, track section Brașov-Sighisoara (electrified double-track line), km 267+220, between **Mureni and Beia** railway stations, track I, the first bogie of the breakdown crane EDK 2000 of 250 tf derailed, being in the train composition,

The investigation report was finished on the 12th April 2018.

#### **Direct causes**

Direct cause of the accident was the overclimbing of the gauge face of the exterior rail of the curve by the left wheel of the first axle in the running direction of the crane EDK 2000, because the twist of the headstock of the bogie derailed, happened before the accident, that favoured the increase of the angle of attack.

### Contributing factors

(1) Non-performance of the technical inspection at the composition of the train no.28261/28261-2 before its routing from the railway station Merișor, the lack of action being favoured by the absence of regulations (conventions, contracts, procedures) CNCF „CFR” SA own (infrastructure manager and not undertaking), for the performance of the technical inspection in the composition of the sequence of operations, before its routing at the running back after the intervention and the infringement of the provisions from the instruction and from the sheet no.26 from the operational technical plan of the railway station Merișor, to check the existence of a train examiner for the performance of the technical inspection at the composition and to submit the train to a railway undertaking for the performance of this inspection.

(2) Putting into running of the train no.28261/28261-2 from the railway station Merișor without confirming upon signature in the form „route sheet” of the locomotive, the performance of the technical inspection at the composition and of the complete braking test by the person who performed it.

(3) Keeping in operation of the rails from the curve exterior with lateral wears and areas with the cross level with values outside the accepted tolerance limits.

### Underlying causes

The underlying causes of the accident were the infringement of the provisions from instructions and regulations in force:

(1) Instruction for the operation of the intervention means no.632/2000, point 1.4, concerning the meeting with the working instructions, orders and regulations in force, in the activity of the intervention means and of their crews.

(2) Regulations for Railway Technical Operation no.002/2001, art.228(1), concerning the setting of the conditions imposed to the technical condition of the railway vehicles (crane).

(3) Sheet no.26 from the Operation Technical Plan of the railway station Merișor, concerning the performance of the technical inspection during the train composition.

(4) Regulations for the train running and shunting of the railway vehicles no.005/2005, art.88(1), and from the Regulations for Railway Technical Operation no.002/2001, art.228(2), concerning the prohibition to couple in train of railway vehicles with failures, respectively danger for the train safety.

(5) Regulations for the train running and shunting of the railway vehicles no.005/2005, art.88(2), concerning the prohibition to couple at the trains and keeping in traffic of railway vehicles non-matriculated in the stock of a railway undertaking or non-authorized for running according to the specific regulations.

(6) Regulations for the accident and incident investigation, for the development and improvement of Romanian railway and metro safety, approved through the Government Decision no.117/2010, Art.16 letter d), concerning the measures to be taken in order to prevent a dangerous situation and to notify by any means the management of the nearest subunit.

(7) Regulations for hauling and braking no.006/2005, art.56(2), concerning the signing of the route sheet by the examiner in order to confirm the performance of the technical inspection and of the complete braking test of the train.

(8) Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989, art.7. A.1, concerning the accepted tolerances against the prescribed cross level.

(9) Instructions of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989”, art.22 and of the values stipulated in the tables 24 and 25, as well as of the art.4 from ”Technical provisions for the measurement of the vertical and lateral wears of the rails” approved through the Order no.30/1298/1987 of the District of Lines București concerning the keeping within the track of the rails in accordance with the vertical and lateral wears.

### Root causes

(1) Lack of regulations for the setting of the conditions imposed for the technical condition of the railway vehicles (crane) and for the way to perform the technical inspections at the breakdown trains.

(2) Non-performance of the assessment and estimation of the risks for the activity of the breakdown trains and of their crews.

### **Additional remarks**

During the investigation, there were the next findings on the deficiencies and lacks, without relevance for the conclusions on the accident causes:

- at the departure of the train from the railway station Simeria, after changing the hauling mean, the driver's assistant of the hauling locomotive performed the continuity test of the automatic brake, without he getting the authorization for the performance of the brake tests, against the provisions of [21], Art.41(2), letter b and of [3], Art.40(2), letter b. The fact is classified as incident happened in connection with the railway safety, in accordance with the provisions of the Regulations, Art.8, point 3.4;
- in the railway station Sighișoara, after the locomotive crew shift exchange, the continuity test of the automatic brake was not performed, although the train stopped in the railway station over 30 minutes, against the provisions of [21], Art.60(1), letter f;
- at the shunting during the composition of the breakdown train in the railway station Merișor on the 14th Aprilie 2017, the shunting plan was not drafted, against the provisions from [7], Art.43(5);
- at the drafting of the form „train consist form” in the railway station Merișor, one could not fill in all the data requested by the form, respectively numbers of the railway vehicle for the crane and the boom holder wagon for the crane and the boom holder wagon and the counterweights, against the provisions of [7], Art.40(2) – „The train consist form is filled in all the data requested by the form”;
- the crane involved in the accident had no planned repair, from its manufacturing in 1985 to the accident occurrence, against the provisions of the railway norms in force [10]÷[13]. It had to be withdrawn from traffic and had no right to run.
- the crane involved in the accident had no technical certificate issued by AFER, for its matriculation and it was not matriculated, against the provisions of [1], point 13.2.4 and [16].
- in the breakdown train there was no staff with work load for shunting, against the provisions from [1], point 4.6.2.

### **Safety recommendations**

On the 15th April 2017, between the railway stations Mureni and Beia, in the running of the train no.28261-2 (breakdown train) the first bogie derailed, in the running direction of the crane EDK 2000 of 250 tf, it being in its composition, the derailment was generated by the twist of the headstock of this bogie, in its running direction.

During the investigation, one found at some non-conformities about the safety management system of the economic operators involved in the accident, respectively the lack of some clear regulations and operational procedure, for the technical inspection of the sequence of operations, for the assessment and estimation of risks, non-performed or performed with omissions concerning the identified dangers, as well as the criteria for the acceptance of the insufficient or unsuitable risks.

One also found out non-conformities concerning the signatures on the form „route sheet”, that can be dangers (a situation that could lead to the occurrence of an accident according to the Regulations EU no.402/2013) in the railway activities.

Taking into account these above mentioned, in accordance with the provisions of Art.25(2) from the Law no.55/2006 concerning the railway safety, the investigation commission recommends Romanian Railway Safety Authority:

(1) to request CNCF „CFR” SA, the revision of the activity of the headstock and their crews, drafting some regulations or procedures ensuring that the running of the means of intervention is performed in accordance with the legal provisions in force and the performance of the assessment and estimation of risks for this activity. One also recommends the identification of some legal solutions for the compliance with the railway norms concerning the performance of the planned repairs at this type of railway vehicles, as well as the getting of the matriculation numbers for their matriculation in the national register of vehicles.

(2) to request SNTFM „CFR Marfă” SA and Unicom Tranzit SA, reevaluation of the assessment and estimation of risks, through the identification of all dangers that can be reasonably identified and the establishment of some criteria for the acceptance of the corresponding risks,

possibly through the establishment of some additional safety measures, so the risks of their occurrence can be acceptable

(3) to analyze the opportunity to revise the running conditions concerning the loads on axle and on linear meter, on Romanian lines, for the railway vehicle involved in the accident, as well as those concerning their running back after the intervention.

(4) to analyse the opportunity to change some existing practice codes or to issue some regulations that can be practice codes, in order to be sure that the signing of the form „route sheet” for the confirmation of the performance of the train technical inspection is done by the same person that performed inspection, taking into account the definition from dictionaries for the ”signature”.

**3.4.9** The railway accident happened on the **24th April 2017**, at about 14:00 o’clock, in the railway county Timisoara, track section Petroșani-Subcetate (electrified double-track line), between the railway stations **Banita and Petroșani**, km.69+24, consisted in the derailment of the first bogie from the 28th wagon of the freight train no.50494 (got by the railway undertaking SC UNICOM TRANZIT SA).

The investigation report was finished on the 20th April 2018.

#### **Direct causes**

Direct cause of the accident was the overclimbing of the gauge face of the rail from the left side of the track, by the flange of the guiding wheel (wheel no.8 – on the left side in the train running direction) from the wagon no.33565423357-6, following the increase of the ratio between the lateral forces appeared at the contact wheel-rail and the load acting on this wheel, so exceeding the stability limit at derailment.

The increase of the ratio between the lateral forces and the load acting on this wheel happened following the load transfer of this wheel and the increase of the lateral force (guiding one) this wheel acted on the rail.

#### **Contributing factors**

- breakage of the upper centre casting from the bogie no.2 (first in the running direction) of the wagon involved and the distortion of the wagon chassis, it leading to the increase of the friction resistance, rising the stiffener of the ensemble bogie – wagon chassis, and the bogie unfit to come back to the normal position after leaving the curve;
- wagon load (bulk), put in the wagon only on the right side in the running direction

#### **Underlying causes**

(1) Infringement of the provisions of art.6, paragraph (2), letter c) corroborated with the Table no.6, point 9 from the Instructions for the technical inspection and maintenance of wagons in operation no.250/2005 concerning the compulsoriness of the train examiner that during the technical inspection at the train forming ensure the inspection of each wagon in order to see if the working condition, distortions and wears of the parts and subassemblies correspond to the conditions and limits stipulated in the instructions.

(2) Infringement of the provisions of point 3.3. from the Annex II of the Regulations for the mutual use of the wagons in the international traffic RIV, concerning the unitary distribution of the load in the wagons.

#### **Root causes**

None.

#### **Safety recommendations**

The derailment of the wagon of the freight train no.50494 was favoured by the existence of some failures at the wagon involved (upper centre casting from the bogie no.2 broken, as well as the wagon chassis distorted). The derailment was also favoured by the wagon load, that was not unitary distributed in the wagon.

As it is mentioned in the chapter *D.2. Underlying causes*, the investigation commission considers that the nonconformities above mentioned were not found because one did not comply with the provisions of:



- instructions for the technical inspection and maintenance of the wagons in operation no.250/2005;

- Annex II of the Regulations for the mutual use of the wagons in international traffic RIV.

Taking into account the factors contributing at the accident occurrence, they being based on the underlying causes that are deviations from the practice codes, as well that the monitoring of the economic operators in the railway field is in charge of Romanian Railway Safety Authority – ASFR, the investigation commission does not consider necessary to issue safety recommendations.

**3.4.10** The railway accident happened on the 20th May 2017, at about 16:55 o'clock, in the railway county Timișoara, in the railway station Livezeni, situated on the track section Livezeni – Lupeni, the first bogie of the 33rd wagon of the freight train no.23815 (got by the railway undertaking SNTFM „CFR Marfă” SA), derailed.

The investigation report was finished on the 16th May 2018.

#### **Direct causes**

Direct cause of the accident was the fall between the rails of the left wheel of the first axle, in the running direction, from the wagon no.81536651217-7. It happened following the unsuitable condition of the line, and the involved wagon was loaded over the limits established through the specific regulations in force.

#### **Contributing factors**

- unsuitable technical condition of the wooden sleepers existing in the area immediately preceding, point 0” (point of derailment);
- non-provision of the material basis of the Line District no.7 Petroșani with normal wooden sleepers;
- insufficient appointment of human resources necessary for the performance of the maintenance of the railway infrastructure in the Line District no.7 Petroșani;
- exceeding of the maximum load on axle, accepted for the line category where the wagon derailed;
- exceeding of the wagon loading limit, over the limit accepted and written down on the wagon.

#### **Underlying causes**

(1) infringement of the provisions of art.25, paragraphs (2) and (4) from the „Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge, no.314/1989“, concerning the failures that impose the replacement of the wooden sleepers and the non-acceptance of unsuitable sleepers within the track;

(2) infringement of the provisions of point 4.1, from Chapter 4 „Norms of manpower and material consumption”, of „Instruction for the line maintenance no.300/1982” concerning the ensuring of norm of manpower for the current manual work;

(3) infringement of points 3.1. and 3.2. from Chapter 3 „Wagon loading” of the Annex II from the regulations for the mutual use of the wagons in the international traffic RIV, concerning the maximum load on axle and the loading limits.

#### **Root causes**

- infringement of the provisions of the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for the whole life time of the lines in the maintenance process”, part of the safety management system CNCF „CFR” SA, concerning the sizing of the staff from the sub-units for the line maintenance, in relation to the total works, it being confirmed by the under-sizing of the staff from the Line District no.7 Petroșani, within the Section L9 Simeria.

- non-application of all provisions of the operational procedure code PO 431-SMS „Identification and assessment of the risks associated to the railway safety” Edition 2, Revision 00 from 2016, part of the safety management system of SNTFM „CFR Marfă” SA, concerning the identification and assessment of risks induced by the delivery – reception of the wagons to/from the clients in the sub-units of the Zonal Freight Center Timișoara.

#### **Measures taken**

Following this accident, the management of the Line Section L9 Simeria disposed the inspection of the lines, in all curves of the line section, having the radius under 250 m.

One drafted a program for measurements in order to remove the failures found: rectification of the track gauge, activation / supplement of the fastening and the replacement of the unsuitable wooden sleepers. In august 2017 Section L 9 Simeria was supplied with 800 new normal wooden sleepers and with 140 wooden sleepers half- good (recovered from other works). With the staff of the section one introduced within the curves 550 new normal wooden sleepers and 150 wooden sleepers, half good (sleepers which condition allows their use within the deflecting sections) (Line 117 Livezeni - Isroni; line 116 D I – station Petroșani curve km 77+400/800 and within the curves L116 DI-II Crivadia – Merișor - Bănița – Petroșani).

Through the consolidations of the curves on the running lines in the railway station Petroșani, for which there were concluded contracts with the thirds, 1082 new normal wooden sleepers were fitted up.

### **Safety recommendations**

On the 20th May 2017, at about 16:55 o'clock, in the railway county Timișoara, in the railway station Livezeni, situated on the track section Livezeni – Lupeni, the first bogie, in the running direction, from the 33rd wagon of the freight train no. 23815 (got by the railway freight undertaking SNTFM „CFR Marfă” SA), derailed. As it is mentioned at the chapter C.5.2. *Safety management system*, the investigation commission considers that:

- infringement of the provisions of the Instruction for the line maintenance no. 300/1982, document associated to the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for the whole life time of the lines in the maintenance process”, part of the safety management system CNCF „CFR” SA, led to an unsuitable maintenance of the track superstructure at the derailment site.
- non-application of all provisions of the operational procedure code PO 431-SMS „Identification and assessment of the risks associated to the railway safety” Edition 2, Revision 00 from 2016, part of the safety management of SNTFM „CFR Marfă” SA, concerning the identification and assessment of risks induced by the delivery – reception of the wagons to/from the clients in the sub-units of the Zonal Freight Center Timișoara, it leading to the reception for transport of the wagon no.81536651217-7, this wagon being loaded over the accepted limits established through the Annex II RIV of the Regulations for the mutual use of the wagons in the international traffic RIV.

Taking into account the findings, the investigation commission considers necessary to issue the next safety recommendation:

- Romanian Railway Safety Authority – ASFR shall make sure that the public railway infrastructure manager CNCF „CFR” SA, identifies and analyses correctly the risks generated by the non-provision of the material basis and human resources for the performance of the infrastructure maintenance and ensures the monitoring of these risks, according to the provisions of the Regulations (UE) no. 1078/2012;
- Romanian Railway Safety Authority – ASFR shall make sure that the railway freight undertaking SNTFM „CFR Marfă” SA revises its own safety management system, so, through the complete application of its own procedures, decrease the risks generated by the delivery – reception of the wagons from the clients.

**3.4.11** The railway incident happened on the **3rd April 2017**, in the railway county Craiova, in the railway station **Roșiori Nord**, in shunting activity, consisted in the derailment of the first bogie of the wagon no.33530823183-6, got by Deutche Bahn Cargo Romania SRL.

The investigation report was finished on the 25th January 2018.

### **Direct causes**

Direct cause of the incident is the hitting of the end of the check rail at the common crossing of the switch no. 57 within the double diamond crossing with slips no 57/61, got by the railway station Roșiori Nord, followed by its climbing by the first left wheel in the running direction of the wagon.

It happened following the increase of the track gauge over the accepted tolerances, under the action of the dynamic forces transmitted to the track by the rolling stock in movement.

#### **Contributing factors:**

- keeping in operation of some track materials whose technical condition led to the decrease of the effectiveness of the fastening system, allowing the movement to the outside of the track of the ensemble rail-check rail – metallic plate, under the action of the dynamic forces of the rolling stock;
- supplying of insufficient quantities of special wooden sleepers for the maintenance and repair of the switches in the railway station Roşiori Nord;
- missing of the centre pivot socket liner from the centre casting of the bogie I (first bogie in the train running direction) of the wagon no. 33530823183-6, it leading to the increase of the rigidity of the ensemble bogie – wagon body, so leading to the increase of the lateral guiding force and implicitly to the decrease of the capacity of the vehicle to negotiate the curve.

#### **Underlying causes**

- violation of the provisions of art. 15, point 11, respectively of art.25, point 4 from the „Instruction of norms and tolerances for the track construction and maintenance for lines with standard gauge no.314/1989”, regarding the fact that unsuitable sleepers are not accepted within the switch;
- violation of the provisions of art. 15, point 17 from „Instruction of norms and tolerances for the track construction and maintenance for the lines with standard gauge no.314/1989”, concerning the existence of voids under the sleepers within the switches;
- violation of the provisions of art. 21, points 4 and 7 17 from „Instruction of norms and tolerances for the track construction and maintenance for the lines with standard gauge no.314/1989”, concerning the existence of some vertical misalignment of the rails over the accepted tolerances, respectively of some lateral misalignment of the rails on the active surface of the rail;
- violation of the provisions from point 2.4.4., letter h) from the Railway technical norm "Railway vehicle. Technical provisions for the rear of the bogie frames that equip the wagons and cars no. 81-005:2006" regarding the keeping in operation of the centre pivot socket liner between the centre casting of the wagon with a height over 6mm.

#### **Root causes**

Non-application of all provisions of the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for whole life cycle of the lines in maintenance process” (including the annexes), part of the safety management system of the railway public infrastructure administrator CNCF „CFR” SA, regarding the coordination of the maintenance at the lines.

#### **Safety recommendations**

The derailment of the wagon 33530823183-6, during the shunting made with the locomotive DA 1691 for its coupling at IRV Roşiori, happened following the non-performance in good time of the maintenance on the double diamond crossing with slips 57/61 from the railway station Roşiori Nord, cumulated with the unsuitable negotiation of the curve by the wagon.

During the investigation, the commission found that the central and regional management of the infrastructure administrator identified, but did not properly manage, the risks generated by the non-performance of the line maintenance, in order to take consequently the viable solutions and measures for keeping under control the danger.

If the public railway infrastructure administrator had met its own procedures for the maintenance, part of the safety management system, it should have kept the technical parameters of the track geometry between the tolerance limits imposed by the railway norms and should have prevented this incident occurrence.

The investigation commission also found that the top management of the railway undertaking did not identify the danger "missing/deterioration in operation of the centre pivot socket liners " and

consequently it did not manage the risks generated by it, leading to an unsuitable negotiation of the curve by the vehicle.

Taking into account that the wagon derailed following the incident from the 3rd April 2017 was previously involved, in similar conditions, on the 28th March 2017, in the railway accident happened in the railway station Ciolpani, the investigation commission considers that, as far as the safety recommendations issued in the Investigation report for this accident shall be implemented, there is no need to issue other safety recommendations for this situation.

**3.4.12** The railway incident happened on the 24th May 2017, at 09:05 o'clock, in the railway county Timișoara, track section Arad–Curtici (electrified double-track line), in the railway station Curtici, km.646+100, consisted in the hit of the current collector cable of the metallic mast for the support of the overhead contact line LC25, by the door of the wagon no.33535421161-7 Eaos (the 15th one from the locomotive) from the composition of the train no. 50419 (got by the railway undertaking UNICOM TRANZIT SA).

The investigation report was finished on the 22nd May 2018.

#### **Direct causes**

The direct cause of the incident is the entry, into the structure clearance for the elements of the railway equipments, of the front left door (having like reference the train running direction), from the wagon no.33535421161-7, the 15th one from the locomotive of the freight train no.50419.

#### **Contributing factors:**

Voluntary action, carried out during the route stop of the freight train no.50419, by thirds non-identified, on the ensuring device and the mechanism for closing the doors of the wagon no.33535421161-7, without these be ensured with safety elements at closing.

#### **Underlying causes**

None.

#### **Root causes**

None.

#### **Additional remarks without relevance for the fact causes:**

During the finding of the fact occurred, as resulted from the chapter *C.1. Presentation of the fact* and the chapter *C.5.5. Interface man-machine-organisation* there were identified some nonconformities with reference to the activity of the locomotive crew and to the operations for the train preparation, that have to be performed for routing the train from the railway station Bârzava, nonconformities which did not influence the fact occurrence.

- through the use of the locomotive crew, who registered 4 consecutive rest times outside the home, 24 hours total, and during the rest time outside the home did not comply in all cases with the condition to be equal with at least half of the previous working time, the provisions of the Minister of Transport's Order no.256/2013 for the approval of the Norms for the maximum continuous duty accepted for the locomotive, performed by the locomotive crew in Romanian railway system, art.8. - (1) that stipulates that in the situation that imposes the rest outside the home, it shall be equal with at least half of the previous working time, and art.9 that stipulates that any rest time at home can be followed by two consecutive rest times outside the home, that cumulated shall not exceed 10 hours.
- there were ignored the conditions of endowment and preparation of the trains art.108, paragraph (2) of the Regulations for the train running and the shunting of the railway vehicles - nr.005, that stipulates that „the trains must have at least 2 agents, from which one is the driver”. During the stop in the railway station Bârzava, the train had not permanently two agents, being times when the driver was not, and in these conditions, the quality of train in running of the rake of wagons stopped in the railway station Bârzava there was no more.
- because the second agent appointed for the train operation (driver's assistant, in this case) was not authorised at that moment for the performance of the braking tests, there were not met the conditions of art.42, letter. D and of art.59, paragraph (1), letter f, from the Instructions for the technical inspection and maintenance of the wagons in operation - no.250, stipulating the

compulsoriness to perform the full braking test of the train in case of „coupling of the hauling locomotive at a train that stopped in a railway station more than without locomotive, irrespective of the temperature” (in the railway station Bârzava, the locomotive was hold coupled with the rake of wagons more than 3 hours), respectively the compulsoriness to perform the continuity test „before the train leaves the railway station or the running line, when the stop or the time from the finishing of the last braking test exceeded 30 minutes” (in our case the train stopped in the railway station Ghioroc 55 minutes).

#### **Safety recommendations**

None.

**3.4.13** The railway accident happened on the **28th May.2017**, at about 05:00 o'clock, in the railway county Craiova, non-interoperable track section Băbeni – Alunu, between **Berbești and Popești Vâlcea** railway stations, km 27+200, consisted in a fire in the locomotive DA 1503, a banking one of the freight train no.79176, got by the railway undertaking SC Grup Feroviar Român SA.

The investigation report was finished on the 15th May 2018.

#### **Direct causes**

Direct cause of the accident was the local overheating into the channel of the cables from the electric traction engine no.4, following the decrease, during the time, of the di-electric strength between the cables with different electric potential, it leading both to the ignition of their insulation and of the oil deposits existing in the area of the fire burst.

#### **Contributing factors**

- unsuitable technical condition of the electric traction engine no.4, with the armature winding deteriorated;
- the lines profile that has slopes up to 21,5 %, gradient in the train running direction cumulated with the train tonnage was 99,75% from the maximum accepted tonnage on this track section;
- existence of oil deposits into the channel of the cables and into the box for the connection of the cables for the power supply of the traction engine no.4.

#### **Underlying causes**

Infringement of the provisions from *Instructions for the activity of the locomotive crew no.201/2006*, approved through the *Minster's Order no.2229/2006*, respectively of the art.44 - (3) letter b), that is, during the intermediary inspections performed at the locomotive DA 1503, the oil leaks from the diesel engine were not removed.

#### **Root causes**

The technical specification *Intermediary inspections RI, planned inspections RT, R1, R2, 2R2, R3 and accidental ones at the diesel electric locomotives of 1250/2100 CP*, code G.4.1-II, that is reference document for the performance of the maintenance, does not contain provisions for the checking of the armature winding at the opposite end of the collector.

#### **Measures taken:**

The locomotive DA 1503 was taken on the 10th July 2017 to SC RELOC SA, where the planned repair type RG (overhaul) was performed, the locomotive began to run starting with the 19th September 2017.

#### **Safety recommendation:**

On the 28th May 2017, at about 05:00 o'clock, in the railway county Craiova, track section Băbeni – Alunu, between the railway stations Berbești and Popești Vâlcea, km 27+200, in the running of the freight train no.79176, a fire burst into the banking locomotive DA 1503.

During the investigation, one found out that one of the factors influencing the accident occurrence is the unsuitable technical condition of the locomotive, following of it the investigation commission recommends Romanian Railway Safety Authority to request the railway freight undertaking SC Grup Feroviar Român SA:

- the performance of a re-assessment of the risks generated by the failure of the rolling stock, that can generate fires;
- analysis of the opportunity to revise the technical specification Intermediary inspections RI, planned ones RT, R1, R2, 2R2, R3 and accidental repairs at the diesel electric locomotives of 1250/2100 CP, code G.4.1-II, so the scheduled maintenance at the traction engines ensure their optimal operation during the time between two planned inspections.

**3.4.14** The railway accident happened on the **7th June 2017**, at 07:04 o'clock, in the railway county Craiova, in **Golești** railway station, on the direct line no. II, in the running of the passenger train no.1782, consisting in the diesel multiple unit DESIRO 2053, got by the railway undertaking SNTFC „CFR Călători” SA 2053, consisted in passing the signal YII in stop position, being on „stop” position, followed by the derailment of its first two bogies, in the running direction.

The investigation report was finished on the 6th June 2018.

#### **Direct causes**

Direct cause of the accident was the impossibility of the human operator to adapt the vehicle speed for its stop on the line no. II, following the unsuitable working of the braking equipment of the diesel multiple unit.

#### **Contributing factors**

- unsuitable maintenance of the diesel multiple unit, it leading to the appearance of some failures at the working of the braking equipment when the diesel multiple unit Desiro 2053 unit brake was applied;
- keeping in operation of the diesel multiple unit Desiro 2053, after achieving the time norm for the performance of the planned repairs.

#### **Underlying causes**

The provisions of the Chapter 3 – Norms for the performance of the inspections and planned repairs of the railway vehicles and their periodicity (cycle), from the Railway norm 67-006:2011 „Railway vehicles. Types of inspections and planned repairs. Norms of time or norms of km run for the performance of the inspections and planned repairs”, approved by the Order of the Minister of Transports and Infrastructure no.315/2011, amended by Order of the Ministry of Transports and Infrastructure no.1359/2012, were not met, as follows:

- subpoint 3.1, that is the multiple unit Desiro 2053 was not withdrawn from traffic at the achievement of the time norm stipulated for the performance of the planned repairs;
- table 3.1, letter A, position no.10, that is the cycle of the planned repairs for the multiple unit Desiro 2053 were not met.

#### **Root causes**

Non-drafting of the specification for the service „Inspection type R9 at the diesel multiple units Desiro SR 20 D – Overhaul inspection”.

#### **Additional remarks**

Therewith, during the investigation, the next deficiencies were identified, without relevance for the accident causes:

- the provisions of art. 44 of the Instructions for the activity of the locomotive crew no.201 were not met, that is at the diesel multiple units Desiro - Siemens intermediate inspections are not made;
- the time norm stipulated for the performance of the planned inspections type R5 and R6 at the diesel-hydraulic Desiro – Siemens, in accordance with the provisions of the Railway Norm NF 67-006:2011 „Railway vehicle. Types of inspections and planned repairs. Norms of time or norms of km run for the performance of the inspections and planned repairs”, approved through the Minister of Transports and Infrastructure’s Order no.315/2011, amended by the Order of Minister of Transports and Infrastructure no.1359/2012 from the 30th August 2012, is not in accordance with the norm of km. So, for the performance of the planned repairs type R5 and R6 the norm of time is established for 1 day, respectively 2 days, and the norm of km at 160 thousand, respectively 320 thousand km;

- in the investigation process one found out that there are differences between the Manual for the maintenance of the diesel multiple units Desiro SR 20 D and the Technical Specification Code ST 12-2005 „Planned inspections type IS200, F1, F2, F3, F4, F5 at the diesel multiple units Desiro SR20D”, regarding the type of the inspections within which there are carried checks at the control box, that is:

- in the manual for the maintenance there are stipulated checks at the control box within the types of planned inspections F4=R5 and F5=R6;
- in the technical specification there are not stipulated these checks within the planned inspections;
- in the Technical Specification Code ST 12-2005 there is nothing written down about the checking of the brake computer BSG, voltage identification devices, electro valves or of other outside elements from the brake equipment command;
- for the performance of the inspections, remediations and repairs of the electric equipments from the multiple units Desiro SR20D there is no documentation (guide, instructions) concerning the interpretation and explication of the electrical plans of the multiple units, the workshop staff having only the electrical plans in German language;
- the Technical Specification T22/1/69/2013 for service „Inspection type R8 at the multiple units Desiro SR 20 D – Overhaul” was drafted in 2013 but SNTFC “CFR Călători” SA had the first diesel multiple units who’s this type of inspection is outstanding since 2008;
- the Order 148 from the 15th May 2012 of Romanian Legal Metrological Office for the periodical checking of the speed recorder I60R at the multiple units Desiro SR 20 D is not met, that is up to now no checks were currently at this type of equipment.
- during the downloads and interpretation of the data from the central computer ZSG and from the speed recorder I60R there was found that its hour is shifted 23’50” forward against the real time posted up by the central computer, the hour has to be set by the workshop staff during the planned inspections according to the Structure no.75 035 001 – Instruction of work and control PZB from the manual for maintenance.

#### **Measures taken:**

After the accident, one drafted a new specification no. D33/3/14/2017 for the service of Inspection type R8 at the multiple units Desiro SR 20 where the chapter “List of works performed during the inspection type R8 at the multiple units Desiro SR 20D – overhaul inspection” at the point 14, subpoint 14.4 the braking computer was introduced ”One checked the operation of the braking computer, with diagnosis soft, and if case, the next constants out of service are replaced (cards of the braking computer): module K2, MODUL K3-K4, module K5, module K7. Modul K8, module K9, module MVB, module Source”

One gave up the contract concluded with SC ELECTROPUTERE VFU Pașcani and the Technical specification drafted by them for the service Inspection type R8 at the multiple unit Desiro SR 20D – Overhaul inspection.

After drafting a new specification, a new contract was concluded with SC REMARUL 16 FEBRUARIE S.A. for the performance of the service Inspection type R8 at the multiple units Desiro SR 20D, where a new Technical specification for the service Inspection type R8 at the multiple units Desiro SR 20D – Overhaul inspection was drafted.

#### **Safety recommendations**

Taking into account the causes and factors generating the railway accident, the investigation commission recommends ASFR to makes certain that the railway undertaking disposes the necessary for the keeping under control the risks generated by the non-compliance with the provisions for the repairs at the railway vehicles.

**3.4.15** The railway accident happened on the **8th June 2017**, at 18:39 o’clock, in the railway county Timișoara, track section Arad-Simeria (electrified double-track line), in **Milova** railway station , km.587+216, in the running of the freight train no.90901 (got by the railway freight

undertaking SC RAIL FORCE SRL), consisted in the derailment of both axles from the second bogie of the 38th wagon

The investigation report was finished on the 6th June 2018.

### **Direct causes**

Direct cause of the accident was the axial displacement of the tyre from the wheel no.1 on the wheel centre, it leading to the accidental change of the distance between the inner faces of the tyres from the wheelset gauge for wheels no.1-2 from the wagon no.31537887008-5 and its derailment.

### **Contributing factors**

- loosening of the tyre of the wheel no.1 from the wagon no.31537887008-5 because the decrease during the time of the fastening forces between the wheel tyre and centre, following the thermic and mechanic stresses appeared in the axle operation (the parts of the wheelset were: axle – 42 years old, disc wheel – 50 years old and the tyre - 26 years old);
- existence of some non-conformities at the paint marks from the wagon wheels.

### **Underlying causes**

Infringement of the provisions of art.10, point (4) from *Instructions for the technical inspection and maintenance of wagons in operation no.250/2005* concerning the compulsory works that have to be performed and ensured by the train examiners within the technical inspection in transit.

### **Root causes**

Non-application of the provisions from the operational procedure code PO-63-01 „*Operational procedure Technical inspection during the train forming, in transit and arrival*” that has as associated document *Instructions for the technical inspection and maintenance of wagons in operation no.250*, concerning the situations of technical inspection at the train arrival.

### **Additional remarks**

During the investigation, the next findings on the deficiencies and gaps were found out, without relevance for the conclusions on the causes:

- the staff who performed the technical inspection of the wagon no.31537887008-5, between the 7th-8th June 2017, had notification notes with red stripe, but their filling in, respectively the delivery of the notifications were not in accordance with the provisions of its own procedures and of the Instructions for delivery-reception of the wagons and the way to recover the failures and degradations found at these no.271/2002, reference document associated to this procedure. It was due both to this staff (non-filling of the way to treat the failure found out and non-delivery of the notifications drafted, upon reception sign, to the representative of the undertaking) and to that staff that ensured the staff endowment (failure of inscription of the name of the railway operator owner, or the inscription of two undertaking on the same form);
- the staff that inspected the wagon no.31537887008-5, between the 7th-8th June 2017, travelled with the same train inspected or that was to be inspected. This working way making impossible the performance all compulsory works within the technical inspections, respectively the visual inspection of those trains at their arrival/departure, against the provisions of Instructions for the technical inspection and maintenance of wagons in operation nr.250/2005;
- from the analysis of the forming of the freight train no.90901, from the 8th June 2017 resulted that the Regulations for hauling and braking no.006/2005, art.36(1), letter a, was not met, concerning the arrangement in the train composition of the locomotives that are not hauling ones, that is these are put in the first half of the train, and in the composition of the freight train no.90901, the dead locomotive EA 528 was coupled at the end of the train.

### **Safety recommendations**

With reference to the railway accident happened in the running of the freight train no.90901 one found out that the loosening of the tyre of the wheel no.1 from the wagon no.31537887008-5, followed by its turning on the wheel centre and the grinding of the fastening ring, happened in the conditions of some deficiencies in the technical inspection and maintenance in the operation of that wagon.



Taking into account these mentioned before, the investigation commission considers necessary to issue a safety recommendations for Romanian Railway Safety Authority – ASFR, that be certain that SC RAIL FORCE SRL, as railway freight undertaking shall re-assess its own measures for the prevention and keeping under control, the reduction of the risks associated to the technical inspection and maintenance of the wagons in operation.

**3.4.16** The railway accident happened on the **15th July 2017**, at 06:40 o'clock, in the railway county Constanta, track section Făurei - Fetești (electrified double-track line), at the entry in **Țândărei** railway station, in the running of the freight train no.61733 (got by the railway undertaking SNTFM „CFR Marfă” SA), consisted in the derailment and overturning of two wagons of the train (the 29th, the 30th ones in the running direction ).

The investigation report was finished on the 11th June 2018.

**Direct cause, contributing factors:**

The direct cause of the accident was the breakage of the axle journal from the wheel no.3 of the wagon no.31537991154-0 (left wheel, in the running direction, of the first axle from the second bogie), it leading to the complete load transfer of that wheel, generating the derailment of the axle with the wheels no.3 and no.4 of that wagon at its running on the curve with left deviation against the train running direction.

**Contributing factors**

- fatigue stresses (stresses composed by traction-compression and rotative bending) to which the axle in the wagon operation is exposed;
- existence of some tendencies to fracture coming from the stress concentrators situated on the exterior surface in the connection area between the section of diameter 146 mm of the shutter and the pressing area of the axle with diameter 185 mm, stress concentrators like micro-grooves/micro-holes that, during the time, led to the appearance of the cross fatigue cracks on the surface of the axle journal, this area could not be seen during the technical inspections, being covered by the axle box;
- long time of the axle use (axle manufactured in 1982).

**Underlying causes**

None.

**Root causes:**

None.

**Safety recommendations**

The railway accident happened following the breakage of the axle journal from the wheel no.3, series CFR 3607481 (IOB 30077), from the wagon no.31537991154-0 got by the railway undertaking SNTFM „CFR Marfă” SA.

Taking into account the factors contributing to the occurrence of the accident, for the prevention of similar accidents, AGIFER considers necessary to issue the next safety recommendations:

- Romanian Railway Safety Authority-ASFR ask the railway undertaking SNTFM „CFR Marfă” SA to draft a n own plan of measures for the additional non-destructive control of the connection between the fitting area of the shutter and the pressing area of the axle, for the axles- of more 30 years old.

**3.4.17** The railway incident happened on the **20th August 2017**, at 21:25 o'clock, in the railway county Cluj, track section Apahida–Oradea (non-electrified double-track line), in **Brăișoru** railway station, consisted in the runaway on the running line Braisoru - Poieni of the diesel multiple units AM DESIRO 2019, up to km 561+520. The DMU was rested out of service from the train 3629 (got by railway undertaking SNTFC „CFR Călători” SA) in the railway station Brăișoru, in the area of the switch no.16.

The investigation report was finished on the 23rd July2018.

**Direct causes**

The direct cause of the incident is the non-application of the measures for keeping stopped, against the runaway, at the diesel multiple units DESIRO 2019, before its uncoupling from the multiple units DESIRO 2116.

#### **Contributing factors**

- non-use of the parking brake equipping the multiple units DESIRO 2019;
- non-use of the hand-brake following its constructive missing at the multiple units type DESIRO;
- non-use of the drag shoes, following the missing of the possibilities to put the standard drag shoes at the wheels of the end axles to the slope, from constructive reasons, at the multiple units type DESIRO;
- slope 3 ‰ of the line where the multiple units was stopped.

#### **Underlying causes:**

- violation of the provisions from art. 40 (10) of the Regulations for hauling and braking - No. 006 concerning the uncoupling of the locomotive only after ensuring the rake of wagons against the runaway;
- violation of the art.69(1) letter b) from the Regulations for the trains running and railway vehicles shunting - No. 005, that is the hauled railway vehicle was uncoupled without being ensured with drag shoes put at the wheels of the extreme axles, at the end to the slope, given the fact that the drag shoes can not be put at the end axles of the multiple units DESIRO, from constructive reasons;
- violation of the Art.69(1) letter b) from the Regulations for the trains running and the shunting of the railway vehicles - No. 005 corroborated with the art. 225 from the Regulations for the Railway Technical Operation - No. 002, that is the vehicle was not ensured with hand brake before its uncoupling, given the fact that the multiple units DESIRO are not equipped with hand brake;
- violation of the art.225. (1) from the Regulations for the Railway Technical Operation - No. 002 regarding the endowment of the railway vehicles with hand brake.

#### **Root causes**

- missing of some safety regulations, that stipulate the sequence of the operations for the handling of the cut-out switches, valves as well as of the lever P113 from the parking brake, in the situation of changing from "hauled condition" to other functional condition, of the multiple unit type DESIRO;
- no identification in the register of the dangers within the Safety Management System – SMS of SNTFC was found, and no risk analysis made, for the danger of runaway resulted from the uncoupling of the multiple units DESIRO, given the fact that at these multiple units is missing the hand brake and the standard drag shoes can not be put at the end axles, from constructive reasons;
- the procedures from SNTFC SMS did not completely met with the requirements L.2, P.1 and P.3 from the Annex II – Regulations (UE) 1158/2010.

#### **Measures taken**

SNTFC took the measures for the additional training of the locomotive crew, regarding the ensuring of the rolling stock against the runaway.

#### **Safety recommendations:**

(A)The investigation commission found that from the dangers register of SNTFC SMS it is missing the runaway danger, resulted from the uncoupling of the multiple units type DESIRO, that are coupled/hauled and are to be uncoupled, given the fact that this type of multiple units can not be ensured with hand brake and standard drag shoes, put at the end axles, *but they are provided with parking brakes*. With the reference to the working of the parking brake at the multiple units DESIRO, the braking order is made by electro-pneumatic way and it is sent by the computer to all the multiple units DESIRO simultaneously, and the braking effect is got by the release of a mechanic spring.

According to the provisions of art. 4(3) from the *Law no.55 from the 16th March 2006 on the railway safety*, responsibilities for the safety operation of the railway system and for the control of the risk associated are for the railway undertaking, that have to implement the measures necessary for the risks control.

Taking into account the learnings taken from this incident, for the improvement of the railway safety and for the prevention of some similar events, the investigation commission considers timely to address to ASFR the next safety recommendations:

**Safety recommendations no.1**

- to request the railway passenger undertakings that get in their fleet multiple units that *are not provided with hand brake*, the performance of a risk analysis concerning the associated dangers for the runaway resulted from the uncoupling of these multiple units;

**Safety recommendations no.2**

- to request the railway passenger undertaking that get in their fleet multiple units *at which standard drag shoes can not be put at the end axles*, the performance of a risk analysis concerning the associated dangers for the case of runaway resulted from the uncoupling of these multiple units.

**(B)**The multiple units SIEMENS-DESIRO have a wide spread, being used by German, USA, Great Britain, Austria, Denmark, etc. railways. The parking brake, providing these multiple units DESIRO, is an advanced technology, but they are not provided with hand brake. Regarding the working of the parking brake at the multiple units DESIRO, the braking effect is made by electro-pneumatic way and it is sent by the computer to all the multiple units DESIRO, composing the train, simultaneously, and the braking effect is got through the release of a mechanic spring. In the same situation, respectively *equipped with parking brake but no hand brake*, there are the multiple units DUEWAG and the DMU ADH11 also, that are presently running on Romanian railway network. The investigation commission found that within the national regulation framework there *is no definition of the parking brake and no stipulations for the use way of the parking brake in case of absence of the hand brake*. In this respect the investigation commission considers necessary the adaption and development of the regulation framework of Romanian railway safety for the safety use of the parking brake, in case of the absence of the hand brake equipment.

According to art.16(f) from the Law 55/2006, only ASFR has the power to promote and, if case, to consolidate and develop the regulation framework of the safety.

In this respect, the investigation commission address ASFR the next

**Safety recommendation no.3**

to analyse the opportunity to consolidate and develop the regulation framework of the railway safety, for the safe use of the parking brakes in case of the hand brake absence.

**3.4.18** The railway accident happened in the running of the passenger train IR no.1366-1 got by the railway passenger undertaking SNTFC „CFR Călători” SA, on the **2nd September 2017**, at 08:11 o'clock, in the railway county Braşov, track section Sfântu Gheorghe-Siculeni (electrified single-track line), in **Băile Tuşnad** railway station, consisted in the derailment of the second bogie of the locomotive EA 078, the hauling one, in the running direction.

The investigation report was finished on the 23rd August 2018.

**Direct causes**

The direct cause of the accident is the mistake of the operator in charge with train running operations, consisting in the operation of the switch no.1/3, during the passing over of the passenger train IR no. 1366-1.

**Contributing factors**

The investigation commission identified the next factors contributing the accident occurrence:

- carrying of the operation activities with the support of a running system whose traffic safety conditions were taken over by the human operator in charge with train running operations („upon the calling-on position of the entry signal”), following the need to change the common running system during the train movement;
- organization of the operation activities at the duty delivery hour in the railway station, that does not assure the necessary time for delivery/taking over the duty and the leaving of the human operators for home

**Underlying causes**

- infringement of the provisions of art.84, paragraph (3) from the manual for the operation of the interlocking system (Instruction for the operation of the interlocking system type CR2 Domino and of the afferent equipments BLSAR and SAT) from the railway station Băile Tuşnad, that prohibits the operation of switches from a train path, made upon the “calling-one” position of the entry signal;
- infringement of the sheet no.11 from the Operation Technical Plan, that is the human operator did not ensure himself about the train stabling.

#### **Root causes**

None.

#### **Safety recommendations**

The activity of the human operator in charge with the organization of the train running in a railway station is very complex related to the railway operation and at the same time very stressful with the need to change the working routines experiences for the activity in a normal running system made with the support of an interlocking system, with a system based on the application of some procedures whose traffic safety conditions have to be taken over by the human operator („upon the position of the calling-on signal”).

In these conditions, the human operator stress increases if the operation activity of the organization does not allow him enough time for the duty delivery, in which the possibilities for the employee travel from the working place to home be taken into account. The situation is valid also if the human operator takes over the duty, especially that in the code of good practice “*Regulations for the train running and railway vehicle shunting - no.005*” an activity compulsory for this operator (movements inspector) is stipulated, this activity concerns the checking of the technical condition of the switches within the railway stations provided with interlocking systems CED or CE, that has to be performed before taking over the duty (art.20, point b).

Taking into account that CNCF CFR SA has employees living in other localities than that where they work for the organization of the train running, AGIFER recommends ASFR to be sure that:

CN CF CFR SA carries out the detailed revision of its own safety management system in order to understand the risk of a serious accident occurrence when an insufficient time is given for the delivery/taking over of the movement duty. The revision has to include but without limitation to the analysis:

- work load of the operator;
- the moment and the occurrence amplitude of a failure at the interlocking system

**3.4.19** The railway accident happened on the **14th September 2017**, at 15:27 o'clock, in the railway county Constanța, non-interoperable track section (managed by SC GFR SA) Capu Midia – Dorobanțu (non-electrified double-track line), in **Capu Midia** railway station, at the dispatching of the freight train no.80464 (got by SC GFR SA) from the line 1, it being composed from 39 wagons, consisted in the derailment of a bogie (second in the running direction) from the 31st wagon (no. 335379633035) on the track section 0497.

The investigation report was finished on the 12th September 2018.

#### **Direct causes**

The direct cause of the accident is the fall between the rails of the right wheels from the second bogie of the wagon no. 33537963303-5, being the 31st wagon of the freight train no.80464. It happened in the conditions of the increase of the gauge value over the maximum accepted value, following the lateral displacement of the exterior rail of the curve, under the action of the dynamic forces transmitted to the track by the rolling stock in running.

#### **Contributing factors**

- unsuitable technical condition of the wooden sleepers in the point „0”, that did not allow the fastening of the coach screws for the fixing of the metallic plates, so under the action of the dynamic forces transmitted to the rails by the wheels of the rolling stock, the gauge value increased over the maximum accepted value of 1470 mm;

- unsuitable technical condition of the exterior rails of the curve in the point „0”, that had wears on the lateral active surface of the rail head over the accepted wear limits, so leading to the increase of the track gauge.

#### **Root causes**

The root cause of the accident is the non-application of the provisions of System Procedure code PS-36 - „Clear definition of the duties afferent to safety and their assignment to the staff with adequate competences”, paragraph 5.3, point 2, concerning the use for safety jobs only authorized employees, medical and psychological able. This procedure is part of the safety management system S.C. Grup Feroviar Român SA, but when the accident happened, the Line District Năvodari used unauthorized staff for gang foreman job.

#### **Safety recommendations**

The derailment of the first bogie from the wagon no. 33537963303-5, the 31st of the freight train no.80394 happened following the unsuitable maintenance of the railway infrastructure.

During the investigation, one found out that the superstructure maintenance was not made in accordance with the provisions of the practice codes (reference/associated documents at the procedures of the safety management system of SC GRUP FEROVIA ROMÂN S.A.).

Taking into account the factors contributing the accident occurrence, being based on underlying causes, that are deviations from the practice codes, as well as that the surveillance of the economic operators from the railway field is the responsibility of Romanian Railway Safety Authority– ASFR, the investigation commission recommends ASFR ask the non-interoperable infrastructure manager, SC Grup Feroviar Român SA to take the necessary measures for the supplement the safety traffic vacancies, in charge with the railway infrastructure maintenance.

**3.4.20** The railway accident happened on the **24th September** 2017, at 23:18 o'clock, in the running of the passenger train InterRegio no. 1765, got by the railway passenger undertaking SNTFC „CFR Călători” SA, in the railway county Cluj, track section Dej Călători - Cluj Napoca (electrified double-track line), km 46+116, in **Dej Călători** railway station, consisted in the derailment of the locomotive EA546 and of six cars of the train.

The investigation report was finished on the 14th September 2018.

#### **Direct causes**

The direct cause of the accident happened on the line 2 of the railway station Dej Călători was the fall between the rails of the right wheels of the electric locomotive EA546, hauling the passenger train no.1765 (wheels running on the rail corresponding to the interior one) and of those 6 train cars.

The fall of the locomotive wheels between the rails happened following the lateral movement of the rails, under the dynamic forces transmitted by the wheels of the rolling stock, generating the increase of the gauge value over the maximum value accepted in operation.

#### **Contributing factors**

- common wooden sleepers, that, through their unsuitable condition, did not allow the fastening of the coach screws for the fixing of the metallic plates and the prevention of their movement along the sleepers, so leading to the increase of the gauge value over the maximum accepted one, under the action of the dynamic forces transmitted to the rails by the wheels of the rolling stock;
- use in the technological process, for the consolidation of the line 2 from the railway station Dej Călători, of some common impregnated wooden sleepers having inside failures that did not allow their use in operation;
- non-stipulation, in the technical specification that was basis for the purchasing procedure of the service „Consolidation of the lines 2, 3 from the railway station Dej Călători”, of the type of wood accepted in the sleeper manufacturing, issues important for the control of the depth impregnation material penetration in the sleepers;
- non-monitoring of the quality of the common wooden impregnated sleeper, used for the consolidation of the line 2 from the railway station Dej Călători, by the railway supplier that performed this work;

- inclusion in the „List of railway critical products, works and services and their inclusion in the risk class” from the 4th March 2008 (document of Romanian Railway Authority-AFER), in the risk class 2A, of the railway critical service „Protection with chemical substances of the wooden products (sleepers and plugs);
- exclusion from the control through AFER technical inspections, of the process for the wooden sleeper manufacturing (railway critical product risk class 1 A), got by the application of a railway critical service risk class 2A of a railway critical product risk class 1A;
- performance of the railway service „impregnation with oil antiseptics, through the method vacuum - pressure, of the railway masts and sleepers „in other conditions than those stipulated in the annex of the got railway agreement;
- AFER endorsement on the conformity certificate issued by a railway supplier, for the railway critical products, that are not included in the Railway Supplier Authorization and in the Technical Homologation Certificate got by it;
- keeping in operation of a railway infrastructure which shape and size did not meet with the shape and sizes of the broken stone bed, stipulated in the codes of good practice, for this reason the stone broken in excess does not allow the visualisation of the sleeper failures, especially at the fastening of the metallic plates;
- non-strict interpretation of the track geometry failures, recorded on the line 2 of the railway station Dej Călători, during the measurements performed with the testing and recording car;
- non-identification of the common wooden sleepers during the periodical inspections and census of the unsuitable sleepers, performed during the time between the date of completion of the consolidation works at the line 2 and the accident occurrence.
- 

#### **Underlying causes**

- infringement of the provisions of provisions from art.25, paragraphs (1), (2) and (4) from „Instruction of norms and tolerances for the track construction and maintenance, for lines with standard gauge no.314/1989”, concerning the replacement of the wooden sleepers whose failures impose it.
- infringement of the provisions from point 4.1. of Chapter 4 „Norms of manpower and material consumption”, from „Instruction for line maintenance no.300/2003” concerning the ensuring of the manpower norm for the current manual maintenance;
- infringement of the provisions from Procedure PO 0-4.11, concerning the inclusion in the contract provisions of the provision for the use just of railway critical products that have to be received by specialized and responsible staff from CNCF „CFR” SA.
- infringement by CNCF „CFR” SA of the provisions from procedure PO 0-4.10, that is the consolidation works at the lines 2 and 3 from the railway station Dej Călători were not surveilled with certified/authorized staff as site supervisor;
- performance by SC SERVTRANS INVEST SA București of the railway critical service for the impregnation of the wooden sleepers without complying with the conditions of the technical agreement got at the service performance;
- supply by SC REACTIV PROD COM SRL Baia Mare of some railway critical products (impregnated wooden sleepers) for which it did not get authorization of railway supplier and certificate of railway technical homologation;
- infringement of the conditions upon which the authorization of railway supplier and certificate of railway technical homologation, established at art. 8, letter k from the Annex 1 of the Minister of Transports’ Order 290/2000 were issued by the railway supplier that performed the work „Consolidation of the lines 2, 3 from the railway station Dej Călători”, that is it did not meet with the compulsory norms for the service performance, using in the repair works impregnated wooden sleepers purchased from a manufacturer that was not authorized by AFER for the supply of those products;
- infringement of the provisions of art.10 (3) from Norm for the technical homologation of the products and/or services from the railway and metro transports - ANNEX 3 of the Minister of Transports’ Order 290/2000, that is the critical service sleeper impregnation was wrong classified in

the risk class 2A. This service is a very important part of the technological process for the manufacturing of the railway critical product sleepers, railway critical product with direct implications in the railway safety and that, according to the provisions of the art.9, letter b), paragraph 4 from the ANNEX 3 of the Minister of Transports' Order 290/2000, is classified in the risk class 1A;

- endorsement by the technical inspection of the conformity certificate, issued by SC REACTIV PROD COM SRL Baia Mare, given the fact that, the supplied products did not meet with the technical manufacturing documentation, the provisions of the art.6 from the Annex 7 of the Minister of Transports' Order no.290/2000 being in;
- infringement of the provisions of art.3, paragraph (2), letter o) from Regulations for the organization and functioning of Romanian Railway Safety Authority – ASFR, ANNEX no. 1 of the Government Decision no. 626/1998 concerning the organization and functioning of Romanian Railway Authority – AFER, for the safety surveillance of the railway suppliers by ASFR.

#### **Root causes**

- lack of effectiveness of the Safety Management System of CNCF „CFR” SA, for the control of the risk afferent to the use/contracting of some products that can endanger the railway safety;
- non-identification of the danger resulted from the use in the works for the repair of the railway infrastructure of some railway critical products (wooden sleepers), that are not submitted to the quality reception and they do not correspond from technically point of view.

#### **Measures taken**

Following the request of Romanian Railway Investigation Agency-AGIFER sent to Romanian Railway Authority-AFER and the railway public infrastructure involved in the accident occurrence CNCF „CFR” SA, for:

clarification of some issues concerning the application of the regulation framework for the technical acceptance of the railway critical products/services used for the railway infrastructure maintenance; removal of the non-conformities identified in the supply of the impregnated wooden sleepers and in their use for the railway infrastructure maintenance,

Romanian Railway Investigation Agency-AGIFER asked Romanian Railway Authority and railway public infrastructure manager involved in the accident occurrence, to submit a point of view and the measures considered necessary to be applied up to the accident investigation completion.

Measures taken by AFER:

- (1) revision by CNCF „CFR” SA of the Technical Specification no. 22/1999, or the drafting of a new specification, whose provisions be according to the regulations in force.
- (2) updating by AFER-ONFR of the document „List of railway critical products, works and services and their inclusion in the risk class”, that will be uploaded on AFER site, having included the product „impregnated wooden sleeper”, included in the risk class 1A, so its manufacturing be submitted to the technical inspection, and the responsibility for this product be completely in charge of the end product supplier.
- (3) training of the technical inspectors who have assigned the companies manufacturing the wooden sleepers concerning their tasks for the participation in tests to which the impregnated sleepers are submitted and which are imposed by the reference documents.

#### **Safety recommendations**

Within Romanian railway network, the railway station CFR Dej Călători is part of the stations situated on non-interoperable track-sections.

The line 2 of the railway station Dej Călători is a direct one, because it is the extensions of the running line track I between the railway stations Gherla and Dej Călători.

The line consolidation, performed by SC TRANSFEROVIAR GRUP SA Cluj, supplier of railway critical services, authorized by AFER, consisted in the replacement of 400 common wooden sleepers. Through the consolidations, the public infrastructure manager, respectively the Railway County Cluj, part of CNCF „CFR” SA, did not perform the renewal or the modernization of this line, only the keeping of the running speed at 50 km/h, corresponding to the speed restriction existing at the beginning of the consolidation.

Following the analysis of the accident conditions and of the actions of the involved actors, before and after the accident occurrence, the investigation commission concluded that the derailment of the locomotive and of those six cars from the passenger train no.1765 happened because the gaps created in the application of the provisions concerning the technical acceptance of the railway products used for the railway public infrastructure maintenance.

The provisions of the legal papers in force, concerning the use of the interoperability constituents for the maintenance of the interoperable railway infrastructure, impose the compulsory of the conformity certificates CE existence.

The technical acceptance of the railway products on Romanian railway network is regulated by the provisions of the Minister of Transports' Order no.290/13.04.2000 (order that is not repealed) concerning the technical acceptance of the products and/or services for the use in the construction, modernization, maintenance and repair of the railway infrastructure and of the rolling stock, for the railway and metro transport, with further amendments. When this legal paper came into force, the provisions of European directives for interoperability were not applicable.

The present provisions applicable for the maintenance of the interoperable lines do not establish unequivocally, the cases where it is imposed the existence of the conformity certificates CE and of the cases where the acceptance of the railway products is made according to the provisions of the Minister of Transports' Order OMT 290/2000.

The fact that, in the „*List of railway critical products, works and services and their inclusion in the risk class*” from the 4th March 2008 (document of Romanian Railway Authority-AFER) the railway critical service „*Protection with chemical substances of the wooden products (sleepers and plugs)*” is included in the risk class 2A, led to the infringement of the provisions of the Minister of Transports' Order no.290/2000.

Also, the Safety Management System of CNCF „CFR” SA recorded a failure in the control of the danger generated by the use/contracting of some railway products, that can endanger the railway safety. So, the structure of the railway public infrastructure manager, in charge with the maintenance of the railway infrastructure afferent to the line 2 from the railway station Dej Călători, did not identify the danger generated by the use in this line consolidation, of some railway critical products (impregnated wooden sleepers), for which the quality reception was not made complying with all the technical controls, specific to the manufacturing of the impregnated wooden sleepers.

Taking into account these above mentioned, the investigation commission recommends Romanian Railway Safety Authority-ASFR as follows:

(4) inclusion in its own documents (guides, guiding documents, etc.), or by any other means that lead to their compliance by the actors, the information necessary for the classification and guiding of the stakeholders from railway market (administrators, railway undertaking, entities in charge with the maintenance, railway suppliers, etc.), concerning the application of the national and European regulations, for putting on Romanian market the railway critical products and interoperability constituents.

(5) ask railway public infrastructure manager CNCF „CFR” SA the revision of the safety management system and the performance of a risk analysis, for the dangers generated by the acceptance at the maintenance works, of the impregnated wooden sleepers, without making all the controls stipulated in the reference technical documentations, that establish their performance way.

(6) following the change and application of the provisions from the document „*List of railway critical products, works and services and their inclusion in the risk class*” by AFER structures, with tasks in this respect, so the risk of non-meeting with the provisions for the conditions imposed for the manufacturing of products from many components be covered.

**3.4.21** The railway accident happened on the **6th October 2017**, at 12:50 o'clock, in the railway county Braşov, during the stabling on the line 10A, in **Brasov Triaj** railway station (electrified line) consisted in the derailment of the first axle from the first bogie of the electric locomotive EA 386, a banking one at the freight train no. 50462, got by the railway undertaking (OTF) S.C. UNICOM TRANZIT S.A.

The investigation report was finished on the 4th October 2018.



### **Direct causes**

Direct cause of the accident was the overclimbing of the rail gauge face of the rail from the exterior of the curve by the flange of left wheel of the first locomotive axle, in the running direction, following the increase of the report between the guiding force and the load acting on this wheel, exceeding within the running the stability limit at derailment, generated by the decrease of the circular radius at values under the minimum tolerance accepted in operation.

### **Contributing factors**

Both the condition of the track geometry, whose elements were not in compliance with the tolerances accepted for the arriving-departure lines from the railway stations, and the level of choking of the ballast, that did not ensure the elasticity of the track.

### **Underlying causes**

Violation of the provisions of „*Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauges - no.314/1989*”, art.7. B.1 concerning the tolerances of the plan track for the deflections of the curves arc of circle and art.15, point.2, a) – general technical conditions for the switches concerning the minimum radius of the curve of the deflecting sections for arriving – departures of trains.

### **Root causes**

None.

### **Additional remarks**

During the investigation, the next findings on some deficiencies and lacks were made, without relevance for the conclusions on the accident causes:

- one carried out measurements with the trolley for the track measurement in the quarters I, II and III of the year 2017. The failures found with the trolley were partially removed (ex. in quarter II 2015 48 failures type IV and 60 ones type III were found, from which 19 ones were removed, overwidening types III and IV);
- the failures found during the measurements with the trolley (especially overwidening) are not totally removed and in accordance with the deadlines established by the instructions in force;
- the register for the measurement of the curves after the switches did not contain the curve elements (theoretical versine, the radius, the tangent, the distances between the last joint until those three characteristic points: beginning, middle, end);
- checking of the rails with the failure detector was performed for the last time in 2011;
- lack of the metallic parts of the switches for the replacement of those out of service;
- the on-board register of the locomotive, some records were made by the drivers, concerning the previous days, not like their own findings, for example the sheet from the 23rd September 2017 where one recorded” Flats at the axle no.1 C.B. (on-board register) from the 12th September 2017”. The locomotive was submitted between 2nd – 3rd October 2017, to accidental repairs, especially consisting in the replacement of the gear box no.4. In the unified working order, one did not record the finding concerning the flats at the axle no.1, this finding not being in the minute for the locomotive delivery after this inspection, but it was not found during the checking performed by the investigation commission after the derailment. We mention also in this respect two sheets on-board, concluded on 16th/17th September 2017, respectively on the 17th September 2017, that had mentions about this issue, as follows: on the 16th/17th September 2017, there is the mention ”Axle no.1 flats from the 12th September 2017”, and on the 17th September 2017, the next driver mentioned ”Axle no.1 flats from the 12th September” but also the mention ”Tyres good without flats”.
- in the on-board register, on some days of September (the 15th, 22nd, 23rd, 26th, 27th) one made mentions on the locomotive sliding. On the 28th September 2017 one checked the loads on the locomotive axles and wheels, respectively the locomotive” weighing”. Before the accident date, this mention is found again, but from the checking of the load on axles and wheels, performed after the derailment, one did not found differences between the loads, that generate a such sliding. We mention that the locomotive sliding can be generated also by other cause, not only by the load distribution on axles and wheels.

### Safety recommendations

Taking into account that the maintenance of the track is performed according to the measures established through the Safety Management System - SMS for keeping under control the risks of railway accidents, the investigation commission did not consider necessary to issue some safety recommendations

**3.4.22** The railway accident happened on the **30th October 2017**, at 18:47 o'clock, in the railway county București, in **București Nord** railway station, consisted in the derailment of the locomotive EA 892, hauling the passenger train IR no.1741, got by the railway undertaking SNTFC „CFR Călători” SA.

The investigation report was finished on the 24th October 2018.

### Direct causes

The direct cause of the accident is the overclimbing of the rail gauge face of the exterior connection rail head of the curve of the switch no.1 by the flange of the left wheel from the axle no. 1 of the locomotive EA 892, following the exceeding of the derailment stability limit. It happened because the track gauge at the common crossing of the switch no.1 had values out of accepted field, and the flange gradient  $qR$  of the flange of left wheel from the axle no.1 exceeded the accepted maximum value.

### Contributing factors

- burrs existing at the common crossing of the switch no.1.
- putting in service of the locomotive under the circumstances the tyre of the left wheel from the axle no.1 had an unsuitable profile.

The investigation commission stipulates that the accident happened following the cumulation of those two factors, its occurrence not being possible if one of these two factors was missing.

### Underlying causes

(1) infringement of the provisions of art.19.2 from Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989, concerning the accepted tolerances against the gauge prescribed for the switches.

(2) infringement of the provisions from Chapter no.7 „Quality technical conditions” from the technical specification code ST 21-2008 edition 1, revision 0 „Re-profiling the tyres from the axles of the railway vehicles on the underfloor lathe type Hegenscheidt”, concerning the fell of the quota  $qR$  between the accepted limits.

### Root causes

(1) Non-application of all provisions of the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for whole life cycle of lines in maintenance process”, part of the safety management system of the public infrastructure manager CNCF „CFR” SA, concerning the performance of the maintenance and periodical repairs of the lines.

(2) Lack of correlation of the requirement from the Chapter no.7 „Quality technical conditions” from the technical specification code ST 21-2008 edition 1, revision 0 „Re-profiling the tyres from the axles of the railway vehicles on the underfloor lathe type Hegenscheidt”, concerning the fell of the flange gradient  $qR$  between the accepted limits, with the provisions of chapter 6, letter e „Measurements carried out after the turning” and with those of chapter 9 „List of the measuring means, of the special devices necessary for the re-profiling”, from the same technical specification.

(3) Incomplete assessment of the danger represented by „Non-checking of the technical conditions that the wheelset of the railway vehicles had to meet with in order to be accepted in traffic”, that is one did not associated also the turner job at this danger in the box „Job/Actor responsible for the safety measure” from „Sheet for the identification of dangers/assessment of generated risks code: F-PO-0-8.5.3-05-03 and the lathe operator.

### Additional remarks

During the investigation some deficiencies and lacks were found, without relevance for the accident causes:

- the cycle of the planned repairs, imposed by the Railway Norms NF 67-006:2011 „Railway vehicles. Types of planned inspections and repairs. Norms of time or norms of km ran for the performance of the planned inspections and repairs”, approved by the Order of Minister of Transports and Infrastructure no.315/2011, amended by the Order of Minister of Transports and Infrastructure no.1359/2012, was not complied with, that is the locomotive EA 892 was submitted on the 31st October 2013 to the planned repair type RR, instead the repair type RG as it is stipulated in the above mentioned paper;
- the provisions of the technical specification ST 21-2008 are not completely met, that is:
  - the values of the tyres dimensions are not written down in the form ST21-FM2 – „Sheet of measurements made with the pattern at the axle reprofiled on lathe”, stipulated by ST 21-2008, being used another form that does not have fields for the diameter of the running tread, height of the flanges of wheel, axial and radial deviations;
  - the values of the radial and axial deviations and the height of the flange of wheel are not measured;
  - there are not all the means and devices for measuring stipulated in the specification;
  - there is no decision for the appointment of the responsible with the axles, who has like main duty the establishment of the target diameter;
  - list of the measuring means is not filled in with the device for the measuring of the roughness degree;
- the provisions of the procedure PP-14 „Performance of the maintenance at the powered railway vehicles” were not completely met, that is, after finishing the works at the rolling stock within the Workshop for Repairs at the locomotives București, re-taking into the operation of the rolling stock is not made through drafting the form „Notification of re-taking into operation” code FPP-14.04, as it is stipulated by the procedure;
- the provisions of the Technical Specification code ST 5-2004, Planned inspections type Pth3, RT, R1, R2, accident repairs, works for winter preparation and works at the updated equipments of the Electric Locomotives 3400/5100Kw”, with further amendments, were not completely met, that is:
  - the form „Evidence of the tyres measuring” code: ST5-R01 is not used, as it is stipulated in the „Sheet of change” at the technical specification code: FM 5/4-2015;
  - at the locomotive EA 892 the works for the adjustment of the mechanical clearances were not made, so their value be within the accepted field;
- according to the Sheet of changes no.4/2015 at the Technical Specification ST 5/2004 the name of this specification was changed, being introduced, accidental repairs, works for winter preparation and works at the updated equipments, but they were not properly changed also the chapters: 1.Activity object, 2.Application field and 3.Class of risk.

### **Safety recommendations**

With reference to the railway accident happened on the 30th October 2017, in the running of the train IR no.1741, one found out that the derailment was influenced by the unsuitable technical potential both of the railway infrastructure and of the rolling stock involved.

In order to keep the technical parameters of the track in accordance with the values imposed by the normal operation of the railway infrastructure, the public infrastructure manager CNCF „CFR” SA, following the identification of the dangers that can be present in the infrastructure maintenance and the assessment of the risks associated to the dangers, took like measures for keeping under control the risks of accident occurrence, the compliance with the provisions from the practice codes, that are part of the safety management system.

The identification by the investigation commission of the deviations from the practice codes, for the track keeping between the technical operation parameters stipulated by those codes, proves that the safety management system is not properly applied by CNCF „CFR” SA.

Also, to re-putting into service of the locomotive EA 892, after re-profiling its tyres, with flange gradient qR over the maximum accepted value, was possible following the infringement of the

provisions of the existing procedures, without correlating the quality requirements from ST 21-2008 with the technical rigging necessary.

During the investigation, one found out that, within the process for the identification of the dangers and for the risk assessment, the danger represented by „*Non-checking of the technical conditions that the wheelset of the railway vehicles had to meet with in order to be accepted in traffic*” was not associated also to the turner job.

In order to prevent some accidents that could happen in similar conditions to those presented in this report, AGIFER issues, for Romanian Railway Safety Authority – ASFR, the next safety recommendations:

(1) to analyse through own surveillance measures, the way the safety management system of the public infrastructure manager is applied and if case to ask CNCF, „CFR”SA, the rectification or the re-assessment of its measures for keeping under control the own risks;

(2) to ask the railway undertaking SNTFC „CFR Călători” SA:

- a. the revision of the technical specification code ST 21-2008 *Re-profiling the tyres from the axles of the railway vehicles on the underfloor lathe type Hegenscheidt*, for the correlation of the quality requirements with the performance conditions and the technical rigging necessary;
- b. Re-assessment of the risks generated by the danger represented by „*Non-checking of the technical conditions that the wheelsets of the railway vehicles had to meet with in order to be accepted in traffic*”, and taking measures for keeping under control.

**3.4.23** The railway accident happened on the 31st October 2017, at 16:35 o'clock, in the railway county Bucuresti, track section Ploiești Vest - Brașov (electrified double-track line), between **Comarnic and Câmpina** railway stations, track II, km 106+400, in the running of the freight train no.21753-2 (got by the railway freight undertaking SNTFM „CFR Marfă” SA), consisted in material leakages and smoke release at the 12th wagon.

The investigation report was finished on the 18th October 2018.

#### **Direct cause, contributing factors**

The direct cause of the incident was the ignition of the mixture between the organic substances and particles of fertilizer with ammonium nitrate (nitrate), situated on the upper part of the arrestor plate, being above the wheel no.4 of the wagon no.33872752172-0. It happened following the existence of some deficiencies of the floor boards in the area of the wheel no.4, that allowed the presence on the arrestor plate of organic substances (papers and wood chips generated by the breakage of the floor boards) mixed with particles of fertilizer with ammonium nitrate (nitrate), and the temperature of the plate increased seriously under the action of the spark flow generated at the contact between the brake shoes and the wheel running surface.

#### **Contributing factors**

- running of the wagon no.33872752172-0 with problems at the floor in the area of the wheel no.4 (board broken);
- presence of remains of fertilizer with ammonium nitrate (nitrate) on the floor of the wagon and arrestor plate;
- the running of the freight train no.21753-2 on about 36 km in braking condition (track section Predeal – Câmpina having the characteristic gradient 20‰, in the train running direction).

#### **Underlying causes:**

(1) Infringement of the provisions of art.52, paragraph (6) of the Regulations for Romanian railway transports concerning the removal of any remains rested from the freight unloaded from the transport means, after the transport having as destination the railway station Tășnad.

(2) Infringement of the provisions of art.88, point 1, letter (t) from the Regulations for the train running and railway vehicles shunting – no.005/2005 concerning the prohibition to couple at trains wagons that are not completely unloaded.

(3) Infringement of the provisions of art.36, paragraph (10) from the Regulations for Romanian railway transports concerning the checking by the forwarder of the transport means put at his disposal.

**Root causes:**

Non-application, completely, of the provisions from the procedures and working instructions, regulating the loading of the wagons, internal regulations that are part of the quality management system applied by the freight forwarder (SC AZOMUREȘ SA).

**Additional remarks:**

Following the investigation, the next findings on some deficiencies and lacks resulted, without relevance for the conclusions on the causes:

- before the dispatching of the train from the railway station Predeal, after ending the shunting, following the cut of the general air pipe, there was necessary the performance of the continuity test of the train braking;
- the tasks of the authorized agent of the railway undertaking, in this case were realized by the driver's assistant of the hauling locomotive, he having no authorization for the performance of the braking tests, against the provisions of art.41, paragraph (2), letter b from the Regulations for hauling and braking no.006, and of art.40, paragraph (2), letter b from Instructions for the technical inspection and maintenance of wagons in operation – no.250/2005.

**Measures taken**

The railway undertaking SNTFM „CFR Marfă” SA, after the railway incident, took the next measures:

- re-training of its staff that participate at the transport of dangerous goods, for its awareness and familiarization with the general provisions of the disposals for the transport of the dangerous goods on the railways;
- re-training of its staff concerning the obligations of the participants for the safety of the dangerous good transports;
- establishment of some internal organization measures, for the unitary application in whole company of the provisions from chapter 5.4.3 of the Regulations for the international railway transport of the dangerous goods (RID);
- on the 6th November 2017, in the Zonal Freight Centre București, where the incident was found out, a safety counsellor was appointed in accordance with the provisions from art.3 of Regulations for the appointment, professional training and examination of the safety counsellors for road, railway or inland waterway transport of the dangerous goods.

**Safety recommendations:**

On the 31st October 2017, between the railway stations Comarnic and Câmpina, in the running of the freight train no.21753-2 a fire burst in the wagon no.33872752172-0, being the 12th wagon of the train.

Following the accident investigation, one found out that the fire was generated by the running of the wagon with problems at the floor in the area of the wheel no.4 (boards broken) and presence of remains of the fertilizer with ammonium nitrate (nitrate) on the wagon floor and on the arrestor plate.

It happened because:

- the operations for the taking over after the unloading and for its delivery for loading of the wagon, were performed without meeting completely with the specific regulations in force;
- the internal regulations for the wagon loading, these being part of the quality management system of SC AZOMUREȘ SA, were not completely applied in case of that wagon.

Taking into account these above mentioned, the investigation commission considers necessary to issue the next safety recommendations:

(1) Romanian Railway Safety Authority – ASFR takes care that, SNTFM „CFR Marfă” SA, like railway freight undertaking shall re-assess its risks afferent to the process for delivery-reception of wagons at/from the customers, as well as the efficiency of the safety measures established, for the keeping under control of this risk.

(2) SC AZOMURES SA, like loader and forwarder of dangerous goods, shall re-assess the implementation of the internal regulations for the loading of the wagons so, it ensures the decrease of the risks afferent this activity.

**3.4.24** The railway incident happened on 8th November 2017, at 14:02 o'clock, in the railway county Iași, in **Vicșani** railway station, consisted in the passing of the entry semaphore A1/2, being on „STOP without passing the signal in stop position!”, by the freight train no.56306 (got by SNTFM „CFR Marfă”).

The investigation report was finished on the 6th February 2018.

#### **Direct causes**

Direct cause of the railway incident was a human mistake appeared in the driving of the locomotive, consisting in the violation of the disposal from the stop order, sent through the semaphore A1/2 being on the position: „STOP without passing the signal in stop position!”.

#### **Contributing factors**

- absence of the driver's assistant in the driving cab of the locomotive, following his going into the engines room of the locomotive;
- inobservance by the driver of the semaphore position.

#### **Underlying causes:**

- violation of the provisions from, Regulations for railway technical operation no.002/2001”, art.59-(4), concerning the passing of a signal in stop position;
- violation of the provisions from, Regulations for signalling no.004/2006”, art.15, paragraph (2), image 14, being on the position, STOP without passing the signal in stop position;
- violation of the provisions from „Instructions for the activity of the locomotive crew no.201/2007”, art.127, paragraph (1), letter a) and art.127, paragraph (2) regarding the obligation of the locomotive crew , in the hauling of the train, shall pay attention to the position of the fixed signals and take the measures imposed by the observations done along the route;
- violation of the provisions from, Instructions for the activity of the locomotive crew no.201/2007”, Art. 137. - (1) Before the caution signal of the railway station, if the driver's assistant runs checking in the engines room and he is not in the driving cab of the locomotive, the driver shall take measures for its calling through the calling equipment;
- violation of the provisions from, Instructions for the activity of locomotive crew no.201/2007”, Art. 137. - (2) The driver's assistant shall occupy the normal place of work in the driving cab and track the signals position, line condition and the conditions for entry in the railway station, notifying the driver in this respect;

#### **Root causes**

None.

#### **Safety recommendations**

In case of the railway incident happened in the running of the freight train no.56306 on the 8th November 2017, consisting in the passing of the entry signal A1/2 from the railway station Vicșani, in stop position, being on „STOP without passing the signal in stop position!”, the investigation commission recommends Romanian Railway Safety Authority – ASFR shall be sure that the railway undertaking SNTFM ”CFR Marfă” will identify the dangers resulted when the specific conditions of operation differ from the general conditions (absence of the track equipments for the installation of speed automatic control, mixed line standard gauge/broad gauge, etc.) and will dispose the safety measures necessary to ensure a risk level acceptable (tolerable) of the system.

The investigation commission considers that this railway incident, in slightly conditions should lead to a serious accident. This remark is based on the analysis of the traffic in the railway station Vicșani during the occurrence of the events chain of the railway incident.

**3.4.25** The railway accident happened on the **13th November 2017**, at 11:25 o'clock, in the railway county Constanța, in **Constanța Mol V5** railway station , on the route for the dispatching to

the railway station Palas, on the track II, of the freight train no. L39896 (got by the railway undertaking SC DEUTSCHE BAHN CARGO ROMÂNIA SRL), a light locomotive, consisted in the derailment of one bogie (the second one in the running direction) of the locomotive no. 91530472002-1, at the level crossing, before the exit signal YS.

The investigation report was finished on the 3rd July 2018.

#### **Direct causes**

Direct cause of the railway accident was the fall between the rails of the left wheel from the first axle of the second bogie, in the running direction of the locomotive LE 91530472002-1. It happened following the increase of the track gauge over the maximum value accepted, following the lateral displacement of the exterior rail of the curve, under the action of the dynamic forces transmitted by the rolling stock in movement to the track.

#### **Contributing factors:**

- unsuitable technical condition of the wooden sleepers at the point „0” did not ensure the fastening of the rails on sleepers, that under the action of the dynamic forces transmitted by the wheels of the rolling stock generated the lateral displacement of the exterior rail, so the value of the gauge increased over the maximum accepted value of 1470 mm;
- quantities of materials and labour were not enough to make the maintenance of the railway infrastructure.

#### **Underlying causes**

- infringement of the provisions of art.25, paragraphs (2) and (4) from „Instruction of norms and tolerances for the track construction and maintenance, for lines with standard gauge no.314/1989”, concerning the failures that impose the replacement of the wooden sleepers and the keeping within the track of unsuitable sleepers;
- infringement of the provisions of point 4.1. from Chapter 4 „Norms of manpower and material consumption”, of „Instruction for the line maintenance no.300/1982” concerning the ensuring of the norm of manpower for the current manual maintenance.

#### **Root causes**

Non-application of the provisions from the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for the whole life time of the lines in maintenance process”, part of the safety management system of CNCF „CFR” SA, with reference to the sizing of staff from Line District no.6 Mol 5 in relation to the works

#### **Safety recommendations**

The derailment of the second bogie of the locomotive LE 91530472002-1 happened following the unsuitable technical condition of the railway infrastructure.

During the investigation, one found out that the unsuitable technical condition of the track is due to the track maintenance, that was not performed in accordance with the provisions of the practice codes/associated to the procedures from the safety management system of CNCF „CFR” SA).

Taking into account that the non-application of the operational procedure SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for whole life time of the lines in maintenance process”, part of the safety management system CNCF „CFR” SA was found out as being root cause of this accident, the investigation commission recommends Romanian Railway Safety Authority – ASFR to take care that the public infrastructure manager CNCF „CFR” SA shall revise its own safety management system, starting with the identification of the dangers, concerning:

- the impact on the traffic safety of the insufficient supply with track materials necessary to keep between the instruction parameters the railway infrastructure;
- sizing of the labour necessary to carry out a suitable maintenance of the railway infrastructure, applying exactly the codes of good practice.

**3.4.26** The railway accident happened on the **16th November 2017**, at about 09:20 o'clock, in the running of the freight train no. 70966, got by the railway freight undertaking MMV Rail România SA, in the railway county București, at the passing through **București Triaj** railway station, to the railway station Bucureștii Noi-Group C, consisted in the derailment of the first bogie from the second wagon (wagon no.338178500249), in running direction.

The investigation report was finished on the 8th August 2018.

#### **Direct causes**

The direct cause of the accident was the overclimbing of the curved point head by the left wheel (in the running direction of the train) of the guiding axle from the wagon no. 338178500249, the 2nd of the freight no. 70966. It happened because the curved point of the switch no.23 broke under the action of the dynamic loads transmitted by the rolling stock, generating a horizontal threshold, between the new rails ends.

#### **Contributing factors**

- replacement of the curved point and of the right stock rail from the switch no.23 with another point (point for double diamond crossing with slips -TJD) that was having another laying of sleepers and that was not homologated for this type of switch, it leading to its assembling with the section where the breakage happened (the cutting up made by planning) on the end of the metallic plate, generating a stress concentrator, favouring the breakage;
- track twist over the value accepted for the train running and shunting, it generating the load transfer of the left wheel from the guiding axle of the derailed bogie (in the train running direction).

#### **Underlying causes**

- infringement of the provisions of art.15, paragraphs (6) and (19) from „Instruction of norms and tolerances for the track construction and maintenance for lines with standard gauge no.314/1989”, concerning the fastening of the switches on the sleepers, that has to be in accordance with the type laying and the non-acceptance that at the train passing the points clearance through the lifting of the tip or heel;
- infringement of the provisions of art. 43. -(1) from Chapter 4 „Norms of manpower and material consumption”, of the „Instruction for the line maintenance no.300/2003” concerning the assurance of the manpower norm at the current hand maintenance;
- the workforce and the quantities of materials insufficient for the infrastructure maintenance.

**Root cause** of the accident was the non-application of the provisions from the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for the whole life cycle of the lines in the maintenance process”, part of the safety management system of CNCF „CFR” SA, concerning the sizing of the staff from the Line District no.4 București, with the reference to the volume of works.

#### **Safety recommendations**

The derailment of the second wagon of the freight train no. 70966 happened following the unsuitable maintenance of the railway infrastructure.

During the investigation one found out that the track superstructure maintenance was not performed in accordance with the provisions of the practice codes (the reference/associated documents of the procedures from the safety management system of CNCF „CFR” SA).

Taking into account the factors contributing to the accident occurrence, factors that are based on underlying causes, that are deviations from the practice codes, as well as that the surveillance of the economic operators from the railway field is the responsibility of Romanian Railway Safety Authority – ASFR, the investigation commission does not consider necessary the issuing of some safety recommendations.

**3.4.27** The railway accident happened on the **20th November 2017**, at 03:45 o'clock, in the railway county Constanța, between **Ciulnița and Călărași Nord** railway stations, , km 9+100, on the track II, in the running of the freight train no. a bogie (the second in the running direction) from the wagon no.33535303552-0 of the freight train no.50451 (got by the railway undertaking UNICOM



TRANZIT SA), consisted in the derailment of one bogie of the wagon no.33535303552-0 (the 30th one from the locomotive).

The investigation report was finished on the 16th November 2018.

#### **Direct causes**

The direct cause of the accident is the breakage of the wheel no.2L from the wagon no. 33535303552-0, the 30<sup>th</sup> one of the freight train no.50451. The breakage of the wheel happened suddenly, completely brittle, following the lack of toughness of the material from which it was made off (manufacturing cast batch no.1383, made in December 1981).

#### **Contributing factors**

- lack of structural mixing of the material from which the wheel is made off (generated by irregular heating/cooling of the blocks, either before the plastic distortion in heat conditions, or after it);
- the carbon content of the wheel material exceeds the maximum value accepted for the steel type (R2N) from which it is made off;
- thermic influence induced in the wheel material by the welds applied on the running surface of the wheel centre, on the lateral exterior surface of the web, as well as at the connection between the web and the boss;
- the fracture resistance was not between the limits accepted for this type of steel for wheels;
- the values of the impact fracture energy to low, these indicate a hard material, without toughness.

#### **Underlying causes**

None.

#### **Root cause**

None.

#### **Safety recommendations**

On the 20th November 2017, between the railway stations Ciulnița and Călărași Nord, in the running of the freight train no.50451, a bogie of the wagon no. 33535303552-0 derailed (the second in the running direction), the derailment being generated by the breakage of the wheel no.2L.

During the accident investigation, one found out that the involved wheel (cast wheel from the cast batch no.13831) was manufactured in 1981, with a service time of 36 years. Also, following the tests and checking made on the wheel no.2L in AFER laboratories, one found that the material structure from which the wheel no. 2L was made off and the chemical composition of this material led to the breakage of this wheel and implicitly to the accident occurrence.

Taking into account these above mentioned, for the decrease of the risk of monobloc wheel breakage, the investigation commission issues the next recommendation:

Romanian Railway Safety Authority – ASFR shall ask railway undertaking and wagon keepers to check if they keep or use wagons provided with monobloc wheels manufactured by SC IOB SA Balș, in December 1981, from the cast batch no.13831. If there are at the wagon in operation wheels from this cast batch, they shall withdraw from traffic and shall be submitted to ultrasonic test (CUS) (this control shall include also the determination of the internal stresses).

**3.4.28** The railway accident happened in the running of the freight train no.90970, got by the railway freight undertaking SC Rail Force SRL Brașov, on the **5th December 2017**, at about 14:20 o'clock, in the railway county Brașov, track section Brașov - Sighișoara (electrified double-track line), km.251+700, between **Cața and Rupea** railway stations, consisted in a fire burst into the hauling locomotive series BB 25500 no.536.

The investigation report was finished on the 3rd December 2018.

#### **Direct causes**

The investigation commission identified the *probable cause* of the accident, in the occurrence of a short circuit in the high voltage box, it leading to a fire beginning at the selector. It generated the

damage of the lining from the selector cover and implicitly to the leakage and ignition of its oil, followed by the fire development in all locomotive equipment's.

#### **Contributing factors**

- hauling of the train on the track section Sighișoara – Beia, with an electric locomotive series 25500, hauling one, and with an electric locomotive series 16500, a banking one, the hauling way is not found in the Annex 1 at the Freight train timetable in the railway county Brașov;
- ageing of the electric equipments appeared following the considerable age of this locomotive, that is 52 years.

#### **Underlying cause**

- violation of the provisions from the Annex 1 at the freight train timetable in the railway county Brașov, concerning the tonnages and hauling ways of the trains, track sections Sighișoara – Vânători, Vânători – Mureni, Mureni – Beia.

#### **Root causes**

- non-identification of the danger of a fire at the powered vehicles and of the danger represented by the violation of the provisions from the timetable for the hauling of the trains, it leading implicitly to the lack of some measures proper for keeping under control the risks generated by these dangers.

#### **Additional remarks**

During the investigation, one found out that the electric locomotive no. 91-53-0-425536-6 was recorded in the National Register of Vehicles – RNV, having as entity in charge with the maintenance SC Rail Force SRL, although it does not get Certificate of Entity in Charge with the Maintenance, granted by Romanian Railway Safety Authority – ASFR, that confirms the acceptance of the maintenance system, in accordance with the Directive 2004/49/CE and with the Minister of Transports' Order 635/2015.

#### **Safety recommendations**

Taking into account the factors and causes leading to the appearance of a fire into the locomotive series BB 25500 no.91-53-0-425536-6, hauling the freight train no.90970 on the 5th December 2017, for the prevention of such cases of accidents that could happen in conditions similar to those presented in this report, according to the provisions Art.25(2) of Law no.55/2006 for the railway safety, AGIFER recommends Romanian Railway Safety Authority – ASFR:

To ask the railway freight undertaking SC Rail Force SRL:

- a. establishment of the tonnage and the hauling way for the trains in case of use of an electric locomotive series 25500 and of an electric locomotive series 16500 and its inclusion in the provisions of Annex I at the timetable of the freight trains in the railway county Brașov, that is going to be valid for 2018/2019;
- b. re-assessment of the risks associated to the railway transport, respectively those generated by the danger of appearance of a fire in the powered vehicles and taking of measures adequate for keeping them under control.

**3.4.29** The railway accident happened in the running of the freight train no.20912, got by the railway freight undertaking Cargo Trans Vagon SA, on the **12th December 2017**, at about 14:40 o'clock, in the railway county Brașov, track section Brașov - Sighișoara, km 237+950, between **Racoș and Rupea** railway stations, consisted in the derailment of locomotive series ED no.9153 0 474061-5 CTV, being hauled, inactive, the second in the train composition.

The investigation report was finished on the 11th December 2018.

#### **Direct causes**

The direct cause of the accident was the overclimbing of the gauge face of the exterior curve rail by the tyre of the right wheel from the first axle of the locomotive ED 061, being hauled, inactive, in the train running direction (axle no.6 of the locomotive), following the increase of the ratio between the guiding force and the load acting on the guiding wheel (right wheel), so exceeding the stability limit at derailment.

### Contributing factors

The factors contributing to the accident occurrence were:

- the unsuitable values of the length of the transverse coupling, of some horizontal clearances between the body and the bogies, as well as of some vertical clearances between the axle boxes and the bogie frames, that were not according the regulation provisions.
- load transfer of the right wheel from the axle no.6 of the locomotive, the leading wheel from the first axle in the train running direction, following the exceeding of the transverse level tolerances and the track twist at the derailment site.

### Underlying causes:

Violation of some provisions from the specification and instructions and regulations in force:

- „Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989”, Art.7. A.1 concerning the tolerances for the stipulated transverse level of a track against the another on, both straight line and in curve;
- Art. 7.A.4, from „Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989”, concerning the tolerances accepted in accordance with the running speeds, against the values of track twist measured at each 2,5 m;
- point 2.8, b), paragraph 1, from the Specification no.214/51/2017, concerning:
  - „, b) Measures taken by the beneficiary: measuring by the Section for track maintenance, with the track trolley, of the track section with speed restriction and of the track section non-given up to it for operation, at 15 days, at least”;
  - Order DGT no.310/4a/2800/1993 – Technical operation conditions for the axles of the electric locomotives – CFR, concerning the values of the horizontal/vertical clearances.

### Root cause

The accident root cause is the non-application of the provisions of the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements for the whole life time of the lines in maintenance process”, part of the safety management system of CNCF „CFR” SA, concerning the coordination of the line maintenance by the maintenance staff from Line District L.1 Racoş and of that in charge with the routing, checking and control of the Section L.2 Sighişoara.

### Additional remarks

During the investigation, the investigation commission found some non-conformities and deficiencies, without relevance for the conclusions and causes of the accident, but which are submitted to the analysis of the parts involved in the accident for the improvement of the own activity, as follows:

- from the statements of the executives, appointed through order for the beginning of the works, the content of the Specification no.214/51/2017 of the Track Division Braşov: „Replacement of wooden sleepers with concrete sleepers on the line 300 II Racoş–Rupea, between km 237+600-238+400”, was not known ( responsible SC – FF – L and the technical responsible with the performance);
- violation of point 3.2.3 point.2 from the Specification no.214/51/2017 concerning „quality and stages of checking of the works and materials”, checking of the gauge, level (transverse and longitudinal), direction and expansion joint, that has to be ended with a minute for the determinant phase ended by the beneficiary and performer;
- from the data supplied to the investigation commission, one found out that the area where the works for the sleepers replacement were performed (km 237+600 -238+400), no measurements of the track long level were performed up to the accident occurrence;
- one did not write down the change of solution for the fastening rail-sleeper type K, stipulated in the Specification no.214/51/2017, at the type SKL 14 on site;
- the theoretical versine of the circular curve (km 237+705 – 238+295) corresponding to the curve radius of 265m, stipulated in the the specification and in the book for the evidence of the curve elements, was 189 mm. After the measurement of the circular curve versines, performed by the investigation commission, the versines measured were corresponding to a higher radius of the circular

curve (about 310 m). One did not find that the condition imposed by the Chapter. II, point 2.1 from the Specification no.214/51/2017 of the Line Division Braşov: „Replacement of wooden sleepers with concrete ones in the line 300 II Racoş–Rupea, between km 237+600 - 238+400, Chapter 2, point 2.1”: „One shall perform the next works, keeping the existing geometrical elements of the curves, including the long level of the track direction, including the fixed points...” ;

- the book for the measurement of the curves, presented to the investigation commission by the work beneficiary, was not filled in with characteristic data of the measured curve, that are basis for the analysis, interpretation and removal of the failures found after those measurements (Picture no.4);

LINIA		De la km 237+600 până la km 238+400		Supralărgirea (mm)		Supralărgirea (mm)		Curbă record (m)																	
Ziua	Luna	Nr. curbei din tabelul de curbe		Săgeata măsurată (mm) din ... în ... metri la coarda de ... metri		Săgeata teoretică pentru coarda aplicată (mm)		Săgeata medie (mm) Supralărgirea Supranălărgirea																	
22-01-	2018	12	13	2	5	3	9	10	12	8	3	14	2	11	12	14	13	12	11	10	11	10	11	10	
		113	112	114	116	115	114	114	113	112	111	111	111	111	111	110	109	108	107	106	105	104	103	102	101

LINIA		De la km 237+900 până la km 238+000		Supralărgirea (mm)		Supralărgirea (mm)		Curbă record (m)																	
Ziua	Luna	Nr. curbei din tabelul de curbe		Săgeata măsurată (mm) din ... în ... metri la coarda de ... metri		Săgeata teoretică pentru coarda aplicată (mm)		Săgeata medie (mm) Supralărgirea Supranălărgirea																	
29-11-	2017	113	114	112	112	104	88	86	96	104	119	114	112	112	110	110	108	108	105	113	119	115	115	115	
02-01-	2018	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
05-01-	2018	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112
05-01-	2018	116	117	114	116	114	112	112	112	112	114	116	116	116	116	115	113	113	113	113	113	113	113	113	113
11-01-	2018	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
		113	112	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113

Picture no.4 – Book for the measurements of the curves Rupea – Racoş, track II (copy)

- violation of the Chapter. III, point. 3.1.1, letter i) from Specification no.214/51/2017 concerning „creation in the yard of a control register for the staff of the beneficiary and of other control public bodies, including the books for the measurement of the geometrical parameters of the track in the work area”;

- according to the provisions of art.22 letter. d), from the Law no. 10/1995 concerning the quality of constructions, re-published, investors, individuals or legal persons, have to check the right performance of building by inspectors or economic agent of specialized consultancy, along the works. These provisions are applied to the constructions and their equipments, irrespective of the ownership, destination, category and class of importance or finance source, for the protection of person life, their

goods, of the society and environment. After the Line Division Brasov issued the Order for the beginning of the works no.219/144/11.09.2017, there were performed without the presence of the authorized yard inspector, appointed through written decision from the beneficiary. The person appointed yard inspector in the order for the beginning of the works was not getting authorization of yard inspector issued by the State Construction Inspectorate, in accordance with the Law no.10/1995, and in the Decision No.200/125/07.09.2017, issued by the Line Division Braşov, before the order for the beginning of the works, the same person is appointed „responsible with the run of the construction contract no.370/24.08.2017”;

- according to the provisions of art. 25 letter c) from the Law no. 10/1995 concerning the quality in constructions, obligations and responsibilities of the makers, the maker of the constructions has the next main obligations: ... „c) assuring of the quality level corresponding to the requirements through an own quality system, designed and made with own staff, with the technical performance responsible, authorized”...

- These provisions are applied to the constructions and their afferent equipment, irrespective of the ownership, destination, category and class of importance and financing source, for the protection of person life, their goods, of the society and environment. This obligation of the maker was stipulated also in the Chapter II, points 2.7 and 2.8, from the Specification no.214/51/2017. These obligations and responsibilities were not met by the maker, that is he did not issue a written decision for the technical responsible with the making and he was not present at works, although he was appointed in the order for the work beginning;

- the technological process of the performed works, presented by the maker to the investigation commission, was not adjusted to their making with the complete close of line (removal of the rails and sleepers, preparing of the sleeper bed, assuring of the track cant and long profile of the track bed – sleeper bed, on all distance on which all the sleepers were replaced in a working phase).

- missing of the rear-view mirrors at the locomotive, against the provisions of the Instructions for the activity of the locomotive staff no.201, Art.40. letter n.

- when the accident happened, the locomotive crew of both locomotives had the maximum accepted continuous duty exceeded, against the provisions of Order no.256/2013 for the approval of Norms for the maximum locomotive continuous duty of Romanian railway locomotive crew.

### **Safety recommendations**

Taking into account the factors contributing the accident occurrence, factors that are based on underlying causes that are deviations from the codes of practice and for keeping under control the railway safety risks, as well as the surveillance of the activities of the economic operators, railway suppliers of products and services is the responsibility of AFER – ONFR, through the Department for Monitoring „CE”/NNTR, the investigation commission does not consider necessary to issue safety recommendations.

**3.4.30** The railway accident happened on the **13th December 2017**, at about 16:50 o'clock, in the railway county Craiova, track section **Goleşti-Brad** de Sus (non-electrified single-track line), km 2+090, , in the running of the freight train no.31700-1, got by the railway undertaking SNTFM "CFR Marfă" SA, consisted in the derailment pf the first bogie of the wagon no.82537883589-6, loaded with oil, being the 25th (the last but one) in the train composition.

The investigation report was finished on the 13th November 2018.

### **Direct causes**

The direct cause of the accident is the overclimbing of the exterior rail of the curve by the guiding wheel (on the right side in the train running direction) from the wagon no. 82537883589-6, following the increase of the ratio between the guiding force and the load acting on that wheel, so exceeding the derailment stability limit.

The increase of the ratio between the guiding force and the load acting on the guiding wheel happened following the load transfer of the right wheel from the guiding axle and the increase of the lateral force (guiding) on this wheel.

### **Contributing factors**

- (1) the factors contributing to the partial vertical transfer of the load of the guiding wheel:
- inefficient Lenoir link friction at the wheels R7 and R8 (guiding axle) – the caps of the suspension springs were in contact with the bogie chassis;
  - a difference of 10 mm (the intermediary point „d” higher) found at the cross level between those two rails of the track, measured in the points marked with „0” and „d”, situated at 2,00m; that distance is relatively close to the distance between the axles of the leading bogie (1,8m) of the wagon no. 82537883589-6, it leading to the increase of the vertical loads acting on the wheels on the cross-over right back-left front and to the partial transfer of the vertical loads acting on the wheels of the another cross-over (right front – left back);
  - negative lateral accelerations developed at the derailment site.
- (2) Factors contributing to the increase of the lateral force (guiding one):
- exceeding of the tolerances accepted for the values of the close track deflections measured on the circular curves with 20 m chord;
  - exceeding of the tolerances accepted at the gauge variations, in operation.

#### **Underlying causes**

- infringement of the provisions from Table 3 of „Instructions on the technical inspection and maintenance of wagons in operation no. 250/2005” with reference to the inefficient Lenoir friction link;
- infringement of the provisions from chapter I, art.7, letter B, point 1 from „Instruction of norms and tolerances for the track construction and maintenance for lines with standard gauge no.314/1989”, with reference to the tolerances accepted for the close track versine’s in the circular curves measured in the middle of 20m chord;
- infringement of the provisions from chapter I, art.7, letter A, point 1 from „Instruction of norms and tolerances for the track construction and maintenance for lines with standard gauge no.314/1989”, with reference to the tolerances accepted for the cross level prescribed for one rail against the another one.

#### **Root causes**

- non-application of all provisions of the operational procedure code PO SMS 0-4.07 „Meeting with the technical specifications, standards and requirements relevant for whole life time of the lines in maintenance process” (including the annexes), part of the safety management system of the public railway infrastructure manager CNCF „CFR” SA, concerning the coordination of the line maintenance.
- infringement of some provisions from "Sheet of measurements for the risk prevention SMS", cod F 431-SMS-2, edition 2, revision 0, part of the safety management system of the railway freight undertaking SNTFM "CFR Marfa" SA, concerning the notification of wagons with failures endanger the traffic safety and cannot be repaired within the train, for their removal from the train with the traffic condition resuming.

#### **Additional remarks**

During the investigation, some irregularities were found at the infrastructure administrator, non-relevant for the accident causes:

- the findings notes drafted during the hierarchical controls at the Lines Districts do not reach the purpose, the measures taken following these controls are mostly unachievable at the unit level, being contradictory with the provisions of PO SMS 0-4.04, part of the SMS implemented at the company level. Also, the notes drafted are not submitted for getting acquainted the management of the railway county Craiova.

#### **Safety recommendations**

During the investigation, the commission found that both the management of the infrastructure manager, central and regional level, and the railway undertaking identified but did not record the risks generated by the non-performance of the line maintenance, respectively of the wagons kept, in order to dispose consequently the solutions and measures viable for keeping under control the derailment danger.

So, if they have been completely applied their own procedures of the safety management system, as well as the provisions of the practice codes, part of SMS, the infrastructure manager should have been able to keep the technical parameters of the track geometry between the tolerances imposed by the railway safety, and the railway undertaking should have been able to take measures in case of failures at its wagons, preventing the occurrence of that accident.

Taking into account the presented issues, the investigation commission recommends ASFR to take care that:

- (1) public railway infrastructure manager:
  - revise „Own register of dangers“;
  - re-assess the measures for keeping under control the risks generated by the non-performance of the line maintenance.
- (2) railway undertaking:
  - revise „Own register of dangers“;
  - manage efficiently the risks generated by the non-performance of the maintenance at the own wagons, as well as by the keeping in operation of the wagons with failures, through the re-assessment of the measures for keeping them under control.

**3.4.31** The railway accident happened on the 1st January 2018, at about 06:26 o'clock, in the running of the passenger train Regio no.4111, got by the railway undertaking SNTFC „CFR Călători” SA, in the railway county Cluj, in the railway station Dej Triaj, direct line 1C (electrified line), consisted in the derailment of both axles from the second bogie of the wagon no. 50532055008-8, the 3rd one from the locomotive, in the running direction.

The investigation report was finished on the 19th December 2018.

#### **Direct causes**

Direct cause of the accident was, the left wheels of the back bogie from the wagon 50532056008-8 climbed onto an obstacle being on the rail, followed by the derailment of the corresponding right wheels, the obstacle being a brake bar detached from the locomotive DA 1356, fallen on the built-up common crossing of the switch 45 T.

The fall of the brake bar happened following the breakage of the pin for the fastening of the bar end, it leading to the exit of the brake bar from the structure clearance of the rolling stock and its fall on the built-up common crossing of the switch 45 T.

#### **Contributing factors:**

- breakage of the pin from the end of the bar, it leading to the exit of the brake bar from the rolling stock structure clearance;
- keeping in operation of the locomotive DA 1356, in a technical condition that did no more assure the safety conditions, after exceeding the norms of time and km imposed for the performance of the planned repairs;
- the monitoring process had not the procedures/processes afferent to the identified danger” Non-meeting with the cycle of inspections and repairs at the rolling stock” and the monitoring of that danger was not performed;
- lack of learning as well as of application of some corrective or preventive measures, that had to be done following some incidents/accidents already generated by the fall of the parts from the locomotives/multiple units.

#### **Underlying causes**

- violation of the provisions from the Railway Norm "Railway vehicles. Types of planned inspections and repairs. Norms of time and km run for the performance of the planned inspections and repairs", approved through the Order of Minister of Transports and Infrastructure 111.315/2011, amended through the Order of Minister of Transports and Infrastructure no.1359/2012, point 3.1, concerning the withdrawal of the locomotive from operation for the performance of the planned repairs;
- violation of the norms of time for the performance of the planned inspections and repairs, stipulated in the Railway Norm " Railway vehicles. Types of planned inspections and repairs. Norms

of time and km run for the performance of the planned inspections and repairs", approved through the Order of Minister of Transports and Infrastructure 111.315/2011, amended through the Order of Minister of Transports and Infrastructure no.1359/2012, table 3.1.

- SNTFC SMS did not meet completely with the requirement Q3 from the Regulations 1158/2010 that stipulates – *There are procedures that assure the learning from the relevant information concerning the investigation and the causes of the accidents, incidents, incidents slight avoided and of other dangerous events and upon these, if necessary, preventive measures are adopted;*
- violation of the provisions from point 2.4. from the Annex of the REGULATIONS (UE) NO. 1078/2012, because one did not identify for use, quantitative and qualitative indicators, that can send early warnings with reference to any deviation from the expected results or can guarantee that the expected results shall be achieved, as it is stipulated;
- violation of the provisions from point 1.1. from the Annex and of those from the Appendix of the REGULATIONS (UE) NO. 1078/2012, because the safety monitoring had no procedures and processes for keeping under control the risks, results following the identification and assessment of SNTFC own risks;
- violation of the art.3 from the REGULATIONS (EU) NO. 1078/2012, because all those 5 activities for the regulation of the monitoring were not performed, respectively:
  - (1) definition of some priorities and of one or more monitoring plans;
  - (2) gathering and analysis of the information;
  - (3) drafting of an action plan for the unacceptable cases of violation of the requirements stipulated in the management system;
  - (4) application of the action plan, if a such plan is drafted;
  - (5) assessment of the effectiveness of the measures included in the action plan, if a such plan is drafted.

#### **Root causes**

- ineffective Safety Management System of SC SNTFC “CFR Călători”, for keeping under control the risks resulted from the use of some locomotives which technical condition can endanger the railway safety;
- non-identification of the *derailment risk of rolling stock*, that can result from the danger already identified – *Non-compliance with the cycle of inspections and repairs at the rolling stock*, in the SHEET FOR THE IDENTIFICATION OF DANGERS/ASSESSMENT OF THE GENERATED RISKS;
- lack in the procedures of SNTFC Safety Management System of some *coherent provisions for the way to learn from incidents/accidents already happened;*
- lack in the procedures of SNTFC Safety Management System of some coherent provisions for the *inspection of the measures for the control of risks after an accident or incident, as well as for taking some preventive or corrective measures in order to prevent their re-occurrence;*
- lack in the procedures of SNTFC Safety Management System of some coherent provisions coherent from which result that *the monitoring consists in those 5 regulated activities;*
- lack in the *Monitoring Strategy* of some coherent provisions *concerning the definition of the quantitative and qualitative indicators;*
- lack in the procedures of SNTFC Safety Management System of some coherent provisions ensuring that for the *monitoring there are procedures and processes for the risk control, resulted following the process for the risk identification and assessment;*
- lack in the procedures of SNTFC Safety Management System of some coherent provisions regulating that the *monitoring is done according to some priorities that take into account the negative consequences for the safety, in the areas with the highest risks;*
- lack in the procedures of SNTFC Safety Management System of some coherent provisions regulating that *only for the non-conformities that are not acceptable*, and action plan must be drafted, implemented and then on must assess the effectiveness of the measures from the action plan;

#### **Safety recommendation**

The derailment was based on causes and factors generated both by the shortcomings of the Safety Management System of SC SNTFC “CFR Călători” SA, and by deviations from the practice



codes. So, the Safety Management System of SNTFC registered a failure in the control of the risk generated by the danger” *Infringement of the cycle of inspections and repairs at the rolling stock*”.

Taking into account the lessons to be learned from this accident, for the improvement of the railway safety and the prevention of some similar events, the investigation commission considers relevant to address Romanian Railway Safety Authority the next safety recommendations:

(1) ask the railway undertaking SC SNTFC “CFR Călători” SA to revise the Safety Management System concerning the proper regulation of the monitoring of the risk control;

(2) ask railway undertaking SC SNTFC “CFR Călători” SA to revise the Safety Management System concerning the proper regulation the learning after an accident or incident, the way to do the revision of the measures for the risk control after an accident or incident, as well as the way to adopt some measures, preventive or corrective ones, for preventing its re-occurrence;

**3.4.32** The railway incident happened on the **30th January 2018**, at 08:40 o’clock, in the railway county Galați, track section Buzău–Făurei (electrified double-track line), in **Cilibia** railway station, consisted in the hit of the supports for the protection of the track inductors of 1000/2000 Hz afferent to the light signals YF and YII, by the locomotive inductor EA 552, hauling the train no.1732 (got by the railway undertaking SNTFC „CFR CĂLĂTORI” SA).

The investigation report was ended on the 14th March 2018.

#### **Direct causes**

The direct cause of the incident was the exit of the inductor fitted on the guard connection from the axle no.1 of the locomotive EA 552, from „ LOCOMOTIVE STRUCTURE CLEARANCE” (Drawing no.2 from the Instruction no.328/2008) and its entrance into „STRUCTURE CLEARANCE FOR THE ELEMENTS OF THE RAILWAY INSTALLATIONS” (Drawing no.4 from the Instruction no.328/2008) .

#### **Contributing factors**

- use the welding for the fixing of the guard connection on the locomotive body, in the front of the running direction at the axle no.1 right, non-meeting with the stipulations of the technical project of the locomotive that was mentioning the fastening with stud bolts and nuts.

#### **Underlying causes:**

- violation of the locomotive technical project, regarding the fixing way of the connection guard at the locomotive.

- violation of the provisions from “TECHNICAL SPECIFICATION CODE ST – 2004, PLANNED INSPECTIONS TYPE Pth3, RT, R1 ȘI R2 AT ELECTRIC LOCOMOTIVES 3400/5100 Kw” point 12 “Guard connection and safety cables between the body and the bogie”, drawn by SC CFR SCRL Brașov S.A., stipulating that within the works Pth3, RT, R1 ȘI R2, at the guard connections shall be performed „**control of the condition, fixing, position and fastening**”.

#### **Root causes**

None.

#### **Measures taken**

Through the address no.1127/03/2018, AGIFER management requested SNTFC „CFR Călători” S.A management to dispose the immediate inspection of the fixing of the guard connections on the supports at all the locomotive of the active stock. This inspection was necessary in order to avoid some similar incidents, as well as to find out the wrong working methods in the maintenance and repair of the rolling stock.

Through the address no. RSC/9/174/2018, SNTFC „CFR Călători” S.A management informed that during the period of time 08-14.02.2018, all the locomotive from the active stock were inspected.

The result of the inspections:

- the locomotive EA 755 – Engine Shed Iași was found with the guard connection axle no. 1 right site welded;

- the locomotive EA 692 – Engine Shed București Călători was found out with the screw for the fixing of the guard connection from the axle no.1 unsuitable.

Nonconformities found at the locomotives EA 755 and EA 692 were removed.

### **Safety recommendations**

None.

**3.4.33** The railway incident happened on the **23rd February 2018**, at 21:10 o'clock, in the railway county Braşov, in **Lunca de Sus** railway station (end X , from km.122+ 300 to km.122+400), consisted in the hitting of the control rods and DAM covers from the switches no.1 and 5, by the locomotive of the passenger train regio no.5122 (got by SNTFC CFR Călători SA).

The investigation report was finished on the 27th March 2018.

### **Direct causes**

Direct cause of the incident was the breakage of the safety elements from the main brake rod adjustor SAB (splint pin and safety cable) and its exit from the structure clearance of the rolling stock (locomotive).

### **Contributing factors**

- keeping in operation of the locomotive 060 EA no. 91 53 0 410731-0, after exceeding the norms of time and km imposed for the performance of the planned inspections and repairs;
- unsuitable maintenance of the locomotive;
- superficial technical inspection made during the stop in the railway station Lunca de Sus.

### **Underlying causes**

(1) violation of the provisions of the Railway Norm "Railway vehicles. Types of planned inspections and repairs. Norms of time and norms of km ran for the performance of the planned inspections and repairs", approved by the Order of Minister of Transports and Infrastructure - OMTI no.315/2011, amended by OMTI no.1359/2012, point 3.1, for the withdrawal of the locomotive from operation in order to submit it to planned repairs.

(2) violation of the norms of time for the performance of the planned inspections and repairs stipulated in the Railway Norm "Railway vehicles. Types of planned inspections and repairs. Norms of time and norms of km ran for the performance of the planned inspections and repairs", approved by the Order of Minister of Transports and Infrastructure - OMTI no.315/2011, amended by OMTI no.1359/2012, table no. 3.1.

### **Root causes**

(1) Unsuitable performance of the assessment and appreciation of the risks for the activity of the locomotive crew, within the process „maintenance of the passenger locomotive”.

(2) Absence of the inspections at the brake rod-adjuster within the planned inspections type PTh3, from the Technical specification for these inspections.

### **Safety recommendations**

On 23rd February 2018, the passenger train no.5212 left the railway station Lunca de Sus and the components of the subassemblies of the locomotive EA 731 (brake rod adjuster SAB) hit the traffic safety installations and the control of the switches no.5 and 1 was lost.

Within the investigation, one found out some issues unsuitable, regarding the maintenance of the electric locomotives and assessment and appreciation of the risks for the activity of the locomotive crew.

The investigation commission recommends Romanian Railway Safety Authority to request SNTFC „CFR Călători” SA:

- re-performance of the assessment and appreciation of the risks for the activity of the locomotive crew, in order to be sure that the dangers identified are properly covered, so the risks of their occurrence be acceptable.â
- to analyse the opportunity of re-drawing the Technical Specification for the planned inspections of the electric locomotives, regarding the inspection type PTh3, in order to be sure that all the measures necessary are taken for performing railway transport in full safety conditions.

**3.4.34** The railway accident happened on the **24th February 2018**, at 07:20 o'clock, in the railway county București, in **Bucureștii Noi** railway station, Group C, in the running of the freight train no.71711-2 (got by the railway undertaking SNTFM „CFR Marfă” SA), on the line 2C, on the switch no. 10C, consisted in the derailment of the first bogie of the locomotive ED 030, in the running direction of the train.

The investigation report was finished on the 4th December 2018.

#### **Direct causes**

Direct cause of this accident was the entrance of the flanges of the left wheels from the first bogie of the locomotive ED 030 into the guiding channel on the direct line of the built-up common crossing of the switch no.10 C, operated on the deflecting section. It happened following the loss of the guiding capacity, generated by the unsuitable condition of the special sleepers, that did not assure the proper fastening (rail-sleepers).

#### **Contributing factors**

- unsuitable technical condition of the special wooden sleepers from the point „0”, that under the action of the dynamic forces of the rolling stock wheels, permitted the movement of the right check rail ( in the train running direction), it leading to the reduction of the gauge and of the protection quota of the built-up common crossing from the switch no.10 C, under the minimum accepted value of 1393 mm, so the flange of the left wheels from the first bogie of the locomotive ED 030 (in the train running direction) ran on the „direct” line of the built-up common crossing. The switch no. 10C was operated on the „deflecting” section on trailing direction;
- under-sizing of the workers existing at the Line District no.1 Bucureștii Noi, staff in charge with the maintenance of the railway infrastructure at the accident site;
- insufficient quantities of wooden sleepers supplied to the District no.1 Bucureștii Noi for the track maintenance and repair.

#### **Underlying causes**

- violation of the provisions of art.25, paragraphs (2) and (4) from „Instruction of norms and tolerances for the construction and maintenance of lines with standard gauge no.314/1989”, concerning the failures that impose the replacement of the wooden sleepers and the non-acceptance of unsuitable sleepers within switches;
- violation of the provisions from point 4.1. of the chapter 4 „Norms of manpower and material consumption”, from „Instruction for line maintenance no.300/1982” concerning the ensuring of manpower norm for the hand maintenance.

#### **Root cause:**

Non-application of the provisions from the operational procedure code PO SMS 0-4.07 „Meeting with the technical specifications, standards and requirements relevant for whole life time of the lines in the maintenance process”, part of the safety management system of CNCF „CFR” SA, concerning the sizing of the staff from the District no.1 Bucureștii Noi, for the total works.

#### **Additional remarks**

During the investigation, the next findings on some deficiencies and lacks, without relevance for the conclusions on the accident causes.

Without relevance on the occurrence of the accident, during the investigation, one found out that the electric locomotive ED 030 was not withdrawn from traffic after reaching the time norm for the inspections and planned repairs, it does not meet with the provisions of the Railway Norm 67-006:2011 " Railway vehicles. Types of inspections and planned repairs. Norms of time and norms of km run for the performance of the inspections and planned repairs", approved through Order of Minister of Transports and Infrastructure no.315/2011, amended through the Order of Minister of Transports and Infrastructure no.1359/2012.

### Safety recommendations

The derailment of the locomotive ED 030, hauling the freight train 71711-2 happened following the unsuitable geometry of the track, being the unsuitable maintenance of the railway infrastructure.

During the investigation, one found out that the maintenance of the track superstructure was not performed in accordance with the provisions of the practice codes (documents of reference/associated to the procedures from the safety management system of CNCF „CFR” SA).

Taking into account the non-application of the provisions PO SMS 0-4.07 „Meeting with the technical specifications, standards and requirements for the whole life time of the lines in maintenance process”, part of the safety management system of CNCF „CFR” SA was found as being the root cause of this accident, for the prevention of some accident cases that could happen in conditions similar to those presented in this report, AGIFER issues, for Romanian Railway Safety Authority – ASFR, the next safety recommendation:

- to analyse through own actions of surveillance, the way the safety management system of the public infrastructure manager is applied and if case ask CNCF „CFR”SA, to correct or re-assess the measures for keeping under control the own risks.

**3.4.35** The railway incident happened on the **17th May 2018**, on the metro network București – main line IV, consisted in the hitting of the housing of the point machine belonging to the switch no. 6, in **Străulești** metro station, respectively no.6 in **Laminorului** metro station with the third rail contact shoe (no.1 left), being on the bogie 1 of REM 109, in the composition of the metro train 54.

The investigation report was finished on the 21st June 2018.

#### Direct causes

The direct cause of the incident is the fitting of the point machine in the train structure clearance.

#### Contributing factors

None.

#### Underlying causes

Contractor performed the work, without execution detail for the bearers changed and without the notification of the designer and beneficiary.

#### Root causes

None.

#### Measures taken during the investigation

All the covers of the point machines from the switches, that were affecting the structure clearance, respectively the covers of the point machines from the switches no.6 and 8 of the metro station Străulești and no.6 and 8 of the metro station Laminorului, were dismantled.

#### Safety recommendations

None.

**3.4.36** The railway incident happened on the **24th July 2018**, at 04:15 o'clock, in the railway county București, track section București – Videle (electrified double-track line), on the track I, between **Zăvestreni – Videle**, km.42+531, consisted in the hitting of the impedance bond afferent to the track circuits delimited by the signal PrXB, by the brake beam detached from the wagon no. 338727536231 (the 10th one from the locomotive) being in the composition of the train no.71712 (got by the railway undertaking SNTFM „CFR Marfă” SA).

The investigation report was finished on the 31st October 2018.

#### Direct cause, contributing factors

The direct cause of this incident was the detachment of the brake beam, in the running direction, from the wheel no.8 of the wagon no.33872753623-1 and its entrance in the structure clearance of the installations.

#### Contributing factors:

- unfastening of the rigid connection ensured by the bolt from the brake hanger, connection A1 of the frame bogie-lever.
- missing of the safety strap from the wheel no.8.

#### Underlying causes

Violation of the provisions of art.6, paragraph (2), letter c and art.10, paragraph (4), letter d, from the *Instructions for the technical inspection and maintenance of the wagons in operation no.250/2005*, regarding the working condition and the wears of the parts and subassemblies.

#### Root causes

None.

#### Safety recommendations

Because this incident happened following the violation of the provisions of art.6, , paragraph (2), letter c and art.10, paragraph (4), letter d, from the *Instructions for the technical inspection and maintenance of the wagons in operation no.250/2005*, regarding the working condition and the wears of the parts and subassemblies, the investigation commission does not consider relevant the issuing of safety recommendations.

**3.4.37** The railway incident happened on the **25th October 2018**, at 11:30 o'clock, in the railway county Timișoara, in **Topleț** railway station, end Y, consisted in the fall of parts from the railway vehicles, leading to the derailment of the second axle from the first bogie (in the running direction) from the wagon no.33530823236-2 of the freight train no.30626 (got by the railway undertaking SC DEUTSCHE BAHN CARGO ROMÂNIA SRL), running between Constanța Port-Orțișoara.

Following the findings of the investigation commission, the investigation was closed and the railway incident was re-classified according to the *Investigation Regulations*, art.10 - "*The deeds of thirds, individuals or legal persons, who put in danger the railway transport safety, leading to the interruption of the railway transport, destruction and/or the theft of parts or materials from the railway vehicles compositions ...*".

### 3.5 Accidents and incidents investigated in the last 5 years

#### Investigations performed between 2014-2018:

Accidents investigated <sup>(1)</sup>		2014	2015	2016	2017	2018	TOTAL
O Accidents (Art.19, 1 + 2)	Train collisions	1	1	1	-		
	Collisions between trains and obstacles	-	-	-	-		-
	Train derailments	16	16	17	26		
	Level crossing accidents	1	1	-	-		
	Persons accidents generated by the rolling stock in motion	-	-	-	-		-
	Rolling stock fires	1	3	5	5		
	Accidents involving dangerous goods	-	-	-	-	-	-
O Trains collisions	-	-	-	-	-	-	

Accidents investigated <sup>(1)</sup>		2014	2015	2016	2017	2018	TOTAL
Incidents	Collisions between trains and obstacles	-	-	-	-	-	-
	Train derailments	-	-	-	-	-	-
	Level crossing accidents	-	-	-	-	-	-
	Person accidents generated by the rolling stock in motion	-	-	-	-	-	-
	Rolling stock fires	-	-	-	-	-	-
	Accidents involving dangerous goods	-	-	-	-	-	-
<b>Incidents</b>		<b>20</b>	<b>26</b>	<b>14</b>	<b>17</b>		
<b>TOTAL</b>		<b>39</b>	<b>47</b>	<b>37</b>	<b>48</b>		

<sup>(1)</sup> one took into account the year of the investigation finishing;

## 4 RECOMMENDATIONS

### 4.1. Brief revision and presentation of the recommendations issued in 2018

Through the issued recommendations, Romanian Railway Investigation Agency aimed the improvement of the railway safety and the prevention of the accidents.

No.	Train/ rolling stock involved		Site of the railway event			Date of the report finishing	Type of railway event	
	No. of train	Type of train	Occurrence site	Occurrence date	Hour		accident	Derailment of the DMU
1.	14389	passenger	Sânicolau Mare-Cenad	07.02.2017	16:10	17.01.2018		
In the railway county Timișoara, track section Sânicolau Mare – Cenad (non-interoperable track section managed by RC-CF Trans SRL Brașov), between <b>Sânicolau Mare and Cenad railway stations</b> , km .66+500, all axles from the multiple unit AMX 526 and the first two axles of the multiple unit trailer no.57-326-9 from the passenger train no.14389 (got by the railway undertaking SC Regiotrans SRL Brașov) derailed.								
Recommendations issued		1	Romanian Railway Safety Authority - ASFR shall be sure that the railway infrastructure administrator SC RC-CF Trans SRL Brașov makes a right identification and analysis of the risks generated by the non-supply of the materials and human resources, necessary to perform the maintenance of the railway infrastructure and monitors those risks in accordance with the provisions of the Regulations (EU) no. 1078/2012.					

		Implemented recommendation (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/62/22.02.2016, informed with reference to the safety recommendation issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.					
2.	50477	freight	Dej-Dej Călători	15.02.2017	06:26	12.02.2018	accident	Derailment of the first bogie from a wagon	
		In the railway county Cluj, track section Dej - Apahida, <b>between Dej and Dej Călători railway stations</b> , km 0+690, in the running of the freight train no. 50477 (got by the railway undertaking OTF UNICOM TRANZIT SA), the first bogie of the 4th wagon derailed, in the running direction							
		Recommendations issued	2	Romanian Railway Safety Authority – ASFR shall ask SC UNICOM TRANZIT SA the revision of the safety management system and performing a risk analysis for the associated dangers for the situation of acceptance for transport of wagons loaded with light metallic wastes in bulk, that do not comply with the loading provisions; 2. Romanian Railway Safety Authority - ASFR shall ask CNCF „CFR” SA the revision of the safety management system and making a risk analysis concerning the associated dangers for the situation of exceeding the tolerances specific to the track geometry;					
		Implemented recommendation (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 1, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.					
		Recommendation in implementation process (open)	1	Romanian Railway Safety Authority, through the paper no. 2310/983/31.07.2019 informed that, with reference to the safety recommendation no. 2, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and they are in implementation process.					
3.	59420A	freight	Călan	02.03.2017	00:50	26.02.2018	incident	Hitting of the installations by the rolling stock	
		In the railway county Timișoara, track section Petroșani–Simeria (electrified double-track line), in <b>Călan railway station</b> , km 12+700, the track magnet of 1000/2000 Hz afferent to the entry signal Y was hit by the inductor of the locomotive EA 272, hauling the train no. 59420A (got by the railway undertaking SC UNICOM TRANZIT SA).							
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall take care that the entities in charge with the maintenance of the electric locomotives type LE will revise the technical procedures/specifications, which are reference documents for the job responsible for the maintenance, in order to identify solutions that cover the risks generated by the breakage of the screws for the fastening of the guard at the electric locomotives					
		Implemented recommendation (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this incident, that it was analysed, the measures, to be taken, were identified and implemented.					

4.	4313	passenger	Baia Mare-Buşag	15.03.2017	09:35	13.03.2018	<b>accident</b>	Derailment of a DMU
		In the railway county Cluj, track section Baia Mare – Satu Mare (non-electrified single-track line), <b>between Baia Mare and Buşag railway stations</b> , km 53+000, the rear axle of the trailing car LVT 138 derailed, in the running direction (got by the railway passenger undertaking SNTFC “CFR Călători” SA), it running like passenger train no. 4313.						
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall ask the railway passenger undertakings, that got in their stock trailing cars type LVS, the performance of a risk analysis for the associated dangers, for the case of breakage of the screws for the fastening of the diesel tanks, from this type of railway vehicles.				
Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this incident, that it was analysed, the measures, to be taken, were identified and implemented.						
5.	5524	passenger	Târgu Frumos	27.03.2017	12:50	26.03.2018	<b>incident</b>	Wrong setting of switch for the train entry
		In the railway county Iaşi, track section Iaşi - Paşcani (electrified double-track line), in <b>Târgu Frumos railway station</b> , the switch was wrong set for the entry route of the train R no.5524 (got by the railway undertaking SNTFC „CFR Călători” SA) by the movements inspector on duty.						
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall analyse the possibility of staff training within CN CF CFR SA, capable to identify the formation of the working routines and the processing of the wrong routines within the training and control activities.				
Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this incident, that it was analysed, the measures, to be taken, were identified and implemented.						
6.	50457	freight	Băniţa - Merişor	08.04.2017	14:35	03.04.2018	<b>Serious accident</b>	Derailment of the locomotive and of 14 wagons
		In the railway county Timișoara, track section Petroșani - Simeria (electrified double-track line), <b>between Bănița and Merișor railway stations</b> , on the track I, km.62+890, the hauling locomotive EA 759 and the first 14 wagons of the freight train no.50457 derailed (got by the railway undertaking SC UNICOM TRANZIT SA), leading to the death of the locomotive crew (driver, driver’s assistant).						
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall take care that the railway undertaking SC UNICOM TRANZIT SA revise its own safety management system, so, applying all its own procedures, reduce the risks generated by the unsuitable physical condition of the locomotive staff.				



		Implemented recommendation (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.					
7.	28261-2	Service train	Mureni-Beia	15.04.2017	11:22	12.04.2018	accident	Derailment of a breakdown crane type EDK	
		In the railway county Braşov, track section Braşov-Sighişoara (electrified double-track line), <b>between Mureni and Beia railway stations</b> , on the track 1, km 267+060, all 4 axles of the first bogie from the breakdown crane EDK 2000 of 250 tf, in its running direction, derailed, being the 4th in the composition of the train no.28261-2, got by CNCF „CFR” SA.							
		Recommendations issued	4	<p>1. Romanian Railway Safety Authority – ASFR shall request CNCF „CFR” SA, the revision of the activity of the breakdown crane and their crews, drawing some regulations or procedures, ensuring that the running of the means of intervention is performed in accordance with the legal provisions in force and the performance of the assessment and estimation of risks for this activity. One also recommends the identification of some legal solutions for the compliance with the railway norms concerning the performance of the planned repairs at this type of railway vehicles, as well as the getting of the matriculation numbers for their matriculation in the national register of vehicles.</p> <p>2. Romanian Railway Safety Authority – ASFR shall request SNTFM „CFR Marfă” SA and Unicom Tranzit SA, reevaluation of the assessments and estimations of risks, through the identification of all dangers that can be reasonably identified and the establishment of some criteria for the acceptance of the corresponding risks, possibly through the establishment of some additional safety measures, so the risks of their occurrence can be acceptable</p> <p>3. Romanian Railway Safety Authority – ASFR shall analyse the opportunity to revise the running conditions concerning the loads on axle and on linear meter, on Romanian lines, for the railway vehicle involved in the accident, as well as those concerning their running back after the intervention.</p> <p>4. Romanian Railway Safety Authority – ASFR shall analyse the opportunity to change some existing practice codes or the issuing of some regulations that can be practice codes, in order to be sure that the signing of the form „route sheet” for the confirmation of the performance of the train technical inspection, is made by the person who performed it, taking into account also the definition of the term „signature”.</p>					
		Recommendation in implementation process (open)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 1, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and in implementation process					
		Implemented recommendations (closed)	3	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendations 2,3 and 4, issued following the investigation of this accident, that they were analysed, the measures, to be taken, were identified and implemented.					

		freight	Livezeni	24.05.2017	16:55	16.05.2018	accident	Derailment of a wagon
8.	23815	In the railway county Timișoara, track section Livezeni – Lupeni, in <b>Livezeni railway station</b> , at the stabling of the freight train no.23815 (got by the railway undertaking SNTFM „CFR Marfă” SA), the first bogie from the 33rd wagon derailed, in the running direction.						
		Recommendations issued	2	1. Romanian Railway Safety Authority – ASFR shall be sure that the public railway infrastructure manager CNCF „CFR” SA, identifies and analyses correctly the risks generated by the non-provision of the logistics and human resources for the performance of the infrastructure maintenance and ensures the monitoring of these risks, according to the provisions of the Regulations (UE) no. 1078/2012; 2. Romanian Railway Safety Authority – ASFR shall be sure that the railway freight undertaking SNTFM „CFR Marfă” SA revises its own safety management system, so, through the complete application of its own procedures, decrease the risks generated by the delivery – reception of the wagons from the clients				
		Implemented recommendations (closed)	2	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to those two safety recommendations, issued following the investigation of this accident, that they were analysed, the measures, to be taken, were identified and they were implemented.				
9.	79176	freight	Berbești-Popești Vâlcea	28.05.2017	05:00	15.05.2018	accident	Fire in a locomotive type DA
		In the railway county Craiova, non-interoperable track section Băbeni – Alunu, between <b>Berbești and Popești Vâlcea railway stations</b> , km 27+200, a fire burst into the locomotive DA 1503, being the banking locomotive of the freight train no.79176 (got by the railway undertaking SC Grup Feroviar Român SA).						
		Recommendations issued	2	1. Romanian Railway Safety Authority shall request the railway freight undertaking SC Grup Feroviar Român SA the performance of a re-assessment of the risks generated by the failure of the rolling stock, that can generate fires; 2. Romanian Railway Safety Authority shall request the railway freight undertaking SC Grup Feroviar Român SA the analysis of the opportunity to revise the technical specification <i>Intermediary inspections RI, planned ones RT, R1, R2, 2R2, R3 and accidental repairs at the diesel electric locomotives of 1250/2100 HP, code G.4.1-II</i> , so the scheduled maintenance at the traction engines ensure their optimal operation during the time between two planned inspections..				
		Implemented recommendations (closed)	2	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to those two safety recommendations, issued following the investigation of this accident, that they were not implemented.				
10.	1872	passenger	Golești	07.06.2017	07:03	06.06.2018	accident	Derailment of a DMU

		In the railway county Craiova, in <b>Golești railway station</b> , on the direct line II, in the running of the passenger train no.1782, consisting in the diesel multiple unit Desiro 2053 (got by the railway passenger undertaking SNTFC „CFR Călători” SA) the exit signal YII was passed in stop position, followed by the derailment of its first two bogies of the multiple unit on the line 2T, in the running direction.						
		Recommendations issued	1	Romanian Railway Safety Authority - ASFR shall be sure that the railway undertaking disposes the necessary for the keeping under control the risks generated by the non-compliance with the provisions for the repairs at the railway vehicles.				
		Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.				
		freight	Milova	08.06.2017	18:39	06.06.2018	accident	Derailment of a wagon
		In the railway county Timișoara, track section Arad-Simeria (electrified double-track line), at the passing of the freight train no.90901 (got by the railway freight undertaking SC RAIL FORCE SRL), in <b>Milova</b> railway station, km 588+000, the second bogie of the wagon nr.31537887008-5, series Zaes (the 37th one of the train), derailed.						
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall be sure that SC RAIL FORCE SRL, like railway freight undertaking will re-assess its own measures for the prevention and keeping under control, with the reduction of the risks associated to the technical inspection and maintenance of the wagons in operation.				
		Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and they were implemented.				
		freight	Țândărei	15.07.2017	06:40	11.07.2018	accident	Derailment and overturning of two wagons
		In the railway county Constanța, track section Făurei - Fetești (electrified double-track line) at the entry in <b>Țândărei</b> railway station, in the running of the freight train no.61733 (got by the railway undertaking SNTFM „CFR Marfă” SA), two wagons of the train derailed and overturned (the wagons 29 and 30 in the running direction).						
		Recommendations issued	1	Romanian Railway Safety Authority-ASFR shall ask the railway undertaking SNTFM „CFR Marfă” SA to draw an own plan of measures for the additional non-destructive control of the connection between the fitting area of the shutter and the pressing area of the axle, for the axles of more 30 years old.				
		Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.				
13.	Shunting operations	passenger	Brăișoru	20.08.2017	21:25	23.07.2018	incident	Runaway of a diesel multiple unit on a running line

		In the railway county Cluj, on the 20th August 2017, at about 21:25 o'clock, in <b>Brăișoru</b> railway station, the multiple unit DESIRO 2019, got by the railway undertaking SNTFC „CFR Călători” SA, runaway on the running line Braisoru – Poieni.						
		Recommendations issued	3	<p>1. Romanian Railway Safety Authority – ASFR shall request the railway passenger undertakings, that get in their fleet multiple units that <i>are not provided with hand brake</i>, the performance of a risk analysis concerning the associated dangers for the runaway resulted from the uncoupling of these multiple units;</p> <p>2. Romanian Railway Safety Authority – ASFR shall request the railway passenger undertaking, that get in their fleet multiple units <i>at which standard drag shoes can not be put at the end axles</i>, the performance of a risk analysis concerning the associated dangers for the case of runaway resulted from the uncoupling of these multiple units.</p> <p>3. Romanian Railway Safety Authority – ASFR shall analyse the opportunity to consolidate and develop the regulation framework of the railway safety, for the safe use of the parking brakes in case of the hand brake absence.</p>				
		Implemented recommendations (closed)	3	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to those three safety recommendations, issued following the investigation of this incident, that they were analysed, the measures, to be taken, were identified and implemented.				
		passenger	Băile Tușnad	02.09.2017	08:11	23.08.2018	accident	Derailment of a locomotive type EA
		In the railway county Brașov, track section Sfântu Gheorghe-Siculeni (electrified single-track line), in <b>Băile Tușnad railway station</b> , in the running of the passenger train IR no.1366-1, got by the railway passenger undertaking SNTFC „CFR Călători” SA, the second bogie of the locomotive EA 078, hauling the passenger train, derailed,						
14.	1366-1	Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall be sure that: CN CF CFR SA carries out the detailed revision of its own safety management system in order to understand the risk of a serious accident occurrence when an insufficient time is given for the delivery/taking over of the movement service. The revision has to include but without limitation to the analysis of:				
		Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.				
		freight	Cap Midia	14.09.2017	15:27	12.09.2018	accident	Derailment of a wagon
15.	80464	In the railway county Constanța, non-interoperable track section (managed by SC GFR SA) Capu Midia – Dorobanțu (non-electrified double-track line), in <b>Capu Midia railway station</b> , in the running of the freight train no.80464 (got by the railway undertaking SC GFR SA), a bogie (second in the running direction) from the 31 <sup>st</sup> wagon (no. 335379633035) on the track section 0497, derailed.						

		Recommendations issued	1	ASFR shall ask the non-interoperable infrastructure manager, SC Grup Feroviar Român SA to take the necessary measures for the supplement of the safety traffic vacancies, in charge with the railway infrastructure maintenance.				
		Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was not implemented.				
		passenger	Dej Călători	24.09.2017	23:18	14.09.2018	accident	Derailment of a locomotive type EA and of 6 cars
		In the railway county Cluj, track section Dej Călători - Cluj Napoca (electrified double-track line), km 46+116, in <b>Dej Călători railway station</b> , in the running of passenger train InterRegio nr.1765, got by the railway undertaking SNTFC „CFR Călători” SA, at the exit from the line 2 to the railway station Gherla, the hauling locomotive 546 and those six cars from train composition derailed.						
16.	1765	Recommendations issued	3	<p>1. Romanian Railway Safety Authority-ASFR shall include in its own documents (guides, guiding documents, etc.), or by any other means that lead to their compliance by the actors, the information necessary for the classification and guiding of the stakeholders from railway market (administrators, railway undertaking, entities in charge with the maintenance, railway suppliers, etc.), concerning the application of the national and European regulations, for putting on Romanian market the railway critical products and interoperability constituents.</p> <p>2. Romanian Railway Safety Authority-ASFR shall ask railway public infrastructure manager CNCF „CFR” SA (public railway infrastructure administrator) the revision of the safety management system and the performance of a risk analysis, for the dangers generated by the acceptance at the maintenance works, of the impregnated wooden sleepers, without making all the controls stipulated in the reference technical documentations, that establish their performance way.</p> <p>3. Romanian Railway Safety Authority-ASFR shall track the change and application of the provisions from the document „List of railway critical products, works and services and their inclusion in the risk class” by AFER structures, with tasks in this respect, so the risk of non-meeting with the provisions for the conditions imposed for the manufacturing of products from many components be covered.</p>				
		Implemented recommendations (closed)	2	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendations, issued following the investigation of this accident, that they were not implemented.				
		Recommendation in implementation process (open)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 2, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and they are in implementation process.				
17.	1741	passenger	București Nord	30.10.2017	18:47	24.10.2018	accident	Derailment of a locomotive type EA
		In the railway county București, in <b>București railway station</b> , the locomotive EA 892, hauling the passenger train IR no.1741, got by the railway undertaking SNTFC „CFR Călători” SA, derailed						

		Recommendations issued	2	<p>1. Romanian Railway Safety Authority – ASFR shall analyse through own surveillance measures, the way the safety management system of the public infrastructure administrator is applied and if case shall ask CNCF „CFR”SA, the rectification or the re-assessment of its measures for keeping under control the own risks;</p> <p>2. Romanian Railway Safety Authority – ASFR shall ask the railway undertaking SNTFC „CFR Călători” SA:</p> <p>a) the revision of the technical specification code ST 21-2008 <i>Re-profiling the tyres from the axles of the railway vehicles on the underfloor lathe type Hegenscheidt</i>, for the correlation of the quality requirements with the performance conditions and the technical endowment necessary;</p> <p>b) re-assessment of the risks generated by the danger represented by „<i>Non-checking of the technical conditions that the wheelset of the railway vehicles had to meet with in order to be accepted in traffic</i> „and taking measures for keeping under control.”</p>				
		Implemented recommendations (closed))	2	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.				
		freight	Comarnic-Câmpina	31.10.2017	16:35	18.10.2018	accident	Fire in a wagon
		In the railway county București, track section Ploiești Vest - Brașov (electrified double-track line), between <b>Comarnic and Câmpina railway stations</b> , track II, km. 104+400, in the running of the freight train no.21753-2 (got by the railway freight undertaking SNTFM „CFR Marfă” SA), a fire burst into the 12th wagon of the train						
18.	21753-2	Recommendations issued	2	<p>1. Romanian Railway Safety Authority – ASFR shall be sure that, SNTFM „CFR Marfă” SA, like railway freight undertaking will re-assess its risks afferent to the process for delivery-reception of wagons at/from the customers, as well as the effectiveness of the safety measures established for the keeping under control this risk.</p> <p>2.SC AZOMURES SA, like loader and forwarder of dangerous goods, shall re-assess the implementation of the internal regulations for the loading of the wagons, so it ensures the decrease of the risks afferent this activity.</p>				
		Implemented recommendations (closed))	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 1, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.				
		Non-implemented recommendation (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 2, issued following the investigation of this accident, that it was not implemented				
19.	56306	freight	Vicșani	08.11.2017	14:06	06.02.2018	incident	Passing by a freight train of a signal in stop position, being on „stop”

		In the railway county Iași, in <b>Vicșani railway station</b> , the entry semaphore A <sub>1/2</sub> was passed in stop position, it having the position „ <i>STOP without passing the signal in stop position</i> ”, by the freight train no.56306, hauled with the locomotive DA 1054, got by SNTFM „CFR Marfă.						
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall be sure that the railway undertaking SNTFM ”CFR Marfă” will identify the dangers resulted when the specific conditions of operation differ from the general conditions (absence of the track equipments for the installation of speed automatic control, standard gauge/broad gauge line straddle, etc.) and will dispose the safety measures necessary to ensure a risk level acceptable ((tolerable) for the system				
		Non-implemented recommendation (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this incident, that it was not implemented				
		freight	Constanța Port Mol V	13.11.2017	11:25	03.07.2018	accident	Derailment of a locomotive type LE
		In the railway county Constanța, in <b>Constanța Mol V railway station</b> , along the dispatching route of the of the freight train no. L 39896 (got by SC Deutsche Bahn Cargo România SRL), to the railway station Palas, on the track II, light locomotive, a bogie from the locomotive nr.91530472002 (the second bogie in the running direction) derailed before the exit signal YS.						
20.	L39896	Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall be sure that the public infrastructure administrator CNCF „CFR” SA will revise its own safety management system, starting with the identification of the dangers, concerning: - the impact on the traffic safety of the insufficient supply with track materials necessary to keep between the instruction parameters the railway infrastructure; - sizing of the labour necessary to carry out a suitable maintenance of the railway infrastructure, applying exactly the codes of good practice.				
		Recommendation in implementation process (open)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and they are in implementation process.				
		freight	Ciulnița–Călărași Nord	20.11.2017	03:45	16.11.2018	accident	Derailment of a wagon
21.	50451	In the railway county Constanța, <b>between Ciulnița and Călărași Nord railway stations</b> , km 9+100, track II, in the running of the freight train no.50541 (got by the railway undertaking SC Unicom Tranzit SA), the second bogie of the wagon no. 33535303552-0 (the 30th one from the locomotive) derailed.						
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall ask railway undertaking and wagon keepers to check if they keep or use wagons provided with monoblok wheels manufactured by SC IOB SA Balș, in December 1981, from the cast batch no.13831. If there are at the wagons in operation wheels from this cast batch, they shall withdraw them from traffic and shall be submitted to ultrasonic test (CUS) (this control shall include also the determination of the internal stresses).				

		Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures to be taken, were identified and implemented.				
22.	90970	freight	Cața-Rupea	05.12.2017	14:20	03.12.2018	accident	Fire in an electric locomotive
		In the railway county Brasov, track section Brașov – Sighișoara (electrified double -track line), km 251+700, between <b>Cața and Rupea railway stations</b> , in the running of the freight train no.90970 (got by the railway undertaking SC Rail Force SRL Brașov) a fire burst into the hauling locomotive series BB 25500 EC 536.						
		Recommendations issued	2	1. Romanian Railway Safety Authority – ASFR shall ask the railway freight undertaking SC Rail Force SRL to establish the tonnage and the hauling way for the trains in case of using an electric locomotive series 25500 and an electric locomotive series 16500 and to include it in the provisions of Annex I at the timetable of the freight trains in the railway county Brașov, that is going to be valid for 2018/2019.				
		2. Romanian Railway Safety Authority – ASFR shall ask the railway freight undertaking SC Rail Force SRL the re-assessment of the risks associated to the railway transport, respectively those generated by the danger of appearance of a fire in the powered vehicles and taking of measures adequate for keeping them under control						
		Implemented recommendations (closed)	2	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to those two safety recommendations, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.				
23.	31700-1	freight	Golești-Bradul de Sus	13.12.2017	16:50	13.11.2018	accident	Derailment of a wagon
		In the railway county Craiova, track section Golești – Bradul de Sus (non-electrified single-track line), km 2+090, in the running of the freight train no.31700-1, got by the railway undertaking SNTFM "CFR Marfă" SA), the first bogie of the wagon no.82537883589-6, the 25th one (last but one), loaded with oil, derailed						
		Recommendations issued	2	1. Romanian Railway Safety - ASFR shall be sure that the public railway infrastructure administrator: <ul style="list-style-type: none"> <li>- revise „own register of dangers”;</li> <li>- re-assess the measures for keeping under control the risks generated by the non-performance of the line maintenance.</li> </ul> 2. Romanian Railway Safety - ASFR shall be sure that the railway undertaking: <ul style="list-style-type: none"> <li>- Revise „Own register of dangers”;</li> <li>- manage efficiently the risks generated by the non-performance of the maintenance at the own wagons, as well as by the keeping in operation of the wagons with failures, through the re-assessment of the measures for keeping them under control.</li> </ul>				
		Recommendation in implementation process (open)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 1, issued following the investigation of this accident, that it was analysed, the measures to be taken, were identified and they are in implementation process.				



		Implemented recommendations (closed))	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 2, issued following the investigation of this accident, that it was analysed, the measures to be taken, were identified and they were implemented.					
24.	4111	passenger	Dej Triaj	01.01.2018	06:26	19.12.2018	accident	Derailment of a car	
		In the railway county Cluj, in <b>Dej Tria railway station</b> , km 2+400, on the direct line 1C (electrified ), km 2+300, in the running of the passenger train Regio no.4111, got by the railway undertaking SNTFC „CFR Călători” SA), both axles of the second bogie from the third car no.50532055008-8, the third one after the locomotive, derailed in the running direction.							
		Recommendations issued	2	1.Romanian Railway Safety Authority shall ask the railway undertaking SC SNTFC „CFR Călători” SA to revise the Safety Management System concerning the proper regulation of the monitoring of the risk control; 2.Romanian Railway Safety Authority shall ask the railway undertaking SC SNTFC „CFR Călători” SA to revise the Safety Management System concerning the proper regulation for the learning after an accident or incident, the way to do the revision of the measures for the risk control after an accident or incident, as well as the way to adopt some measures, preventive or corrective ones, for preventing its re-occurrence;					
		Recommendation in implementation process (open)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 1, issued following the investigation of this accident, that it was analysed, the measures to be taken, were identified and they are in implementation process.					
		Implemented recommendations (closed)	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation no. 2, issued following the investigation of this accident, that it was analysed, the measures to be taken, were identified and they were implemented.					
25.	5212	passenger	Lunca de Sus	23.02.2018	---	27.03.2018	incident	Hitting of the installations by the rolling stock	
		In the railway county Braşov, in <b>the railway station Lunca de Sus</b> , the traffic safety installations were hit and the control of the switches 5 and 1 lost, in the railway station, by parts of the subassemblies of the locomotive EA 731 (Depot Galaţi), hauling the train Regio no.5122, got by the railway undertaking SNTFC CFR Călători SA.							
		Recommendations issued	2	Romanian Railway Safety Authority shall request SNTFC „CFR Călători” SA the re-performance of the assessment and evaluation of the risks for the activity of the locomotive crew, in order to be sure that the dangers identified are properly covered, so the risks of their occurrence be acceptable. Romanian Railway Safety Authority shall request SNTFC „CFR Călători” SA the analysis of the opportunity of re-drawing the Technical Specification for the planned inspections of the electric locomotives, regarding the inspection type PTh3, in order to be sure that all the measures necessary for performing railway transports in complete safety and comfort conditions.					

		Implemented recommendations <b>(closed)</b>	2	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to those two safety recommendations, issued following the investigation of this incident, that it was analysed, the measures, to be taken, were identified and they implemented.				
26.	71711-2	freight	Bucureștii Noi	24.02.2018	07:20	04.12.2018	<b>accident</b>	Derailment of a locomotive type ED
		In the railway county București, in <b>Bucureștii Noi railway station</b> , Group C, in the running of the freight train no.71711-2 (got by the railway undertaking SNTFM „CFR Marfă” SA), on the line 2C, switch no. 10C, the first bogie of the locomotive ED 030 derailed in the running direction of the train.						
		Recommendations issued	1	Romanian Railway Safety Authority – ASFR shall analyse through own actions of surveillance, the way the safety management system of the public infrastructure administrator is applied and if case ask CNCF „CFR”SA, to correct or re-assess the measures for keeping under control the own risks.				
		Implemented recommendations <b>(closed)</b>	1	Romanian Railway Safety Authority, through the paper no.2310/983/31.07.2019, informed with reference to the safety recommendation, issued following the investigation of this accident, that it was analysed, the measures, to be taken, were identified and implemented.				

## 4.2. Situation of the implementation of the safety recommendations issued in the last 5 years

Investigations finished in	Number of the issued recommendations	Number of the implemented recommendations	Number of the recommendations in implementation process	Number of the recommendations for which AGIFER communicated that will not be taken into account	Number of the recommendations without answer
2014	17	6	6	4	1
2015	32	7	10	8	7
2016	27	0	0	19	8
2017	31	1	0	1	29
2018	42	30	6	6	0
<b>TOTAL</b>	<b>149</b>	<b>44</b>	<b>22</b>	<b>38</b>	<b>45</b>

**General Manager**  
**PhD. Eng.Vasile BELIBOU**