



**ROMANIAN RAILWAY
INVESTIGATION AGENCY
- AGIFER -**

**ANNUAL REPORT
2017**



INTRODUCTION

This is the Annual Report of Romanian Railway Investigation Agency AGIFER (hereinafter referred to as AGIFER) for 2017. It was drafted 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 on the railway safety.

This reference legislation is uploaded also on AGIFER site www.agifer.ro.

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1 PRESENTATION

1.1 Foreword of AGIFER General Manager

If we make an analysis of the year 2017, regarding the investigations, the data are as follows:

- investigation of a total number of 78 accident/incidents, from which 37 were open in 2016, the other 41 ones in 2017;
- conclusion of 48 investigations (increased with 30% against 2016), respectively: 31 railway accidents (from which a serious one) and 17 railway incidents.

The reality show us that there is a very wide range of causes, basis of the accidents/incidents occurrence. This reality forces us to deal with complete responsibility the assessment of the dangers and risks associated them, and the monitoring strategies are meant to reduce the unacceptable non-conformities, that can become anytime causes generating accidents / incidents. In this respect, the Safety Management System plays a very important role in the improvement of the railway safety.

An investigation as open as possible, an unitary approach of the measures for the improvement of the railway safety allow us to identify together with the railway sector its real problems, without affecting AGIFER independence.

Reviewing of all accidents in the annual report has as purpose the setting of a data basis ,usefull for all economic agents that perform railway transports, from which, each of them, according to the activity's specific, can learn and establish own measures for prevention.

In this respect, the safety recommendations have to be instruments for the prevention of some similar accident, having no purpose the establishment of guilty and responsibility

The important increase of the accident and incident number is a relevant indication for the railway safety on Romanian Railway Network, the causes and the possible solutions can be found also in AGIFER investigation reports.

Unfortunately, the most part of the safety recommendations are without answers from Romanian Railway Safety Authority - ASFR, with reference to their implementation, therefore, the identification of an effective communication between those two institutions shall be one of AGIFER priorities for the next period of time.

Taking into account the increase of the number of the railway accidents and incidents investigated, AGIFER management had to find solutions for the effective use of its specialists and ask for the additional jobs, respectively the change of AGIFER organization chart.

In 2017 the investigation report of the railway serious accident happened in the shunting of the railway undertaking a SNTFM CFR Marfă SA , in the railway county Craiova, in the railway station Bârsești, consisting in the serious collision of two electric locomotives, was completed. Following the collision, the driver of one locomotive died and the driver of the another one was seriously injured, dying too afterwards.

The investigation of the serious accident happened in the railway station Barsesti emphasized the deficiencies in the working of the dimmer from the locomotive EA, the sub-ensemble changed before, that led to the decrease of the safety level.

Starting from these findings , AGIFER issued recommendations for the re-classification of the railway critical products from the command circuit of the dimmer and taking of ensuring measures up to the recomendation implementation

One also issued safety recommendations for the revision of the legislation afferent to the homologation of the products and services for the repairs of the railway vehicles , so this be in accordance with European provisions for the certification of the entities in charge with the maintenance, other than wagons and for practical training (including a simulator) for unusual and dangerous situations, so the human operator form skills and suitable action schemes if he confronts with unusual situations

The investigation of this accident and of other accidents and incidents involved actively our two specialists in human factors , part of our team, and whose activity becomes more and more important following the increase of the accident number, whose cause was the human error

AGIFER activity at European level included the active participation in the working groups of NIB Network, in those organized by European Union Agency for Railways and its participation in ESReDA working group „Safety foresight”,

Thank to all the organizations we cooperated within this year, to NIB Network, European Union Agency for Railways, all NIBs partener, with which AGIFER cooperated both in investigations and in good practice sharing.

Not finally, I'd like to thank to AGIFER specialists, for the high levels of the investigations, for their professionalism and responsibility.

General Manager AGIFER

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 analyze and study the causes and circumstances that led to their occurrence. AGIFER can also perform other tasks established through the 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 that approves 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 managers, 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 signaling 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 mentioned 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 2017

At the end of 2017, AGIFER had 43 employees, that is:

- 1 general manager;
- 1 deputy general manager;
- 1 economic director;
- 2 advisers of the general manager;
- 4 department heads;
- 21 investigators;
- 2 psychologists;
- 1 legal adviser;
- 1 auditor;

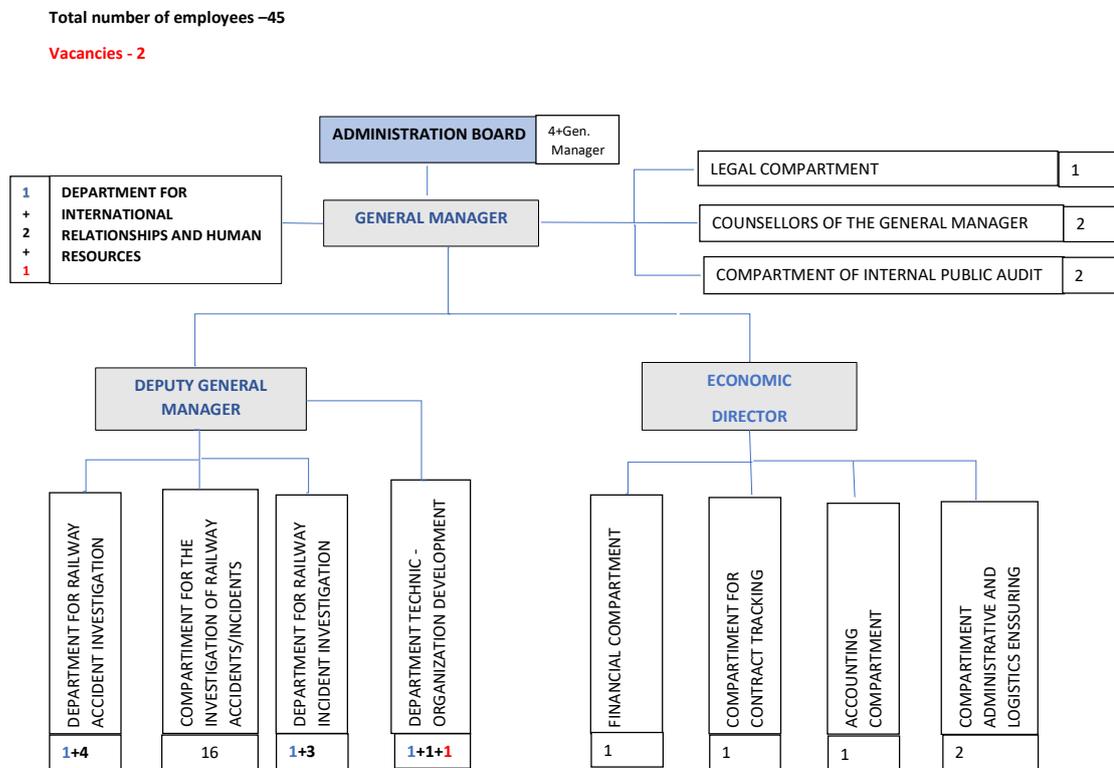
- 5 experts;
- 1 technician;
- 1 referent;
- 2 economists.

Budget

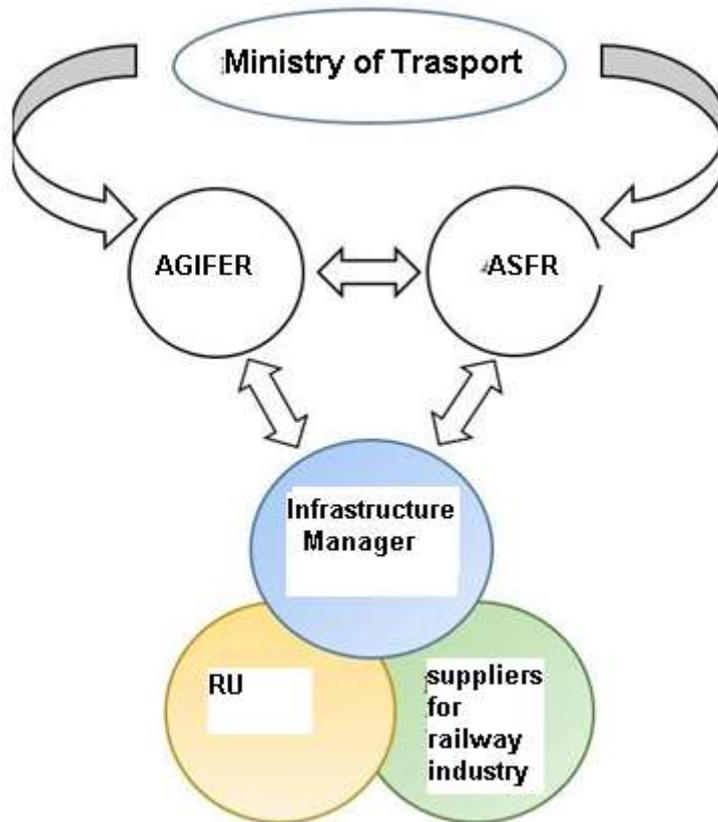
For its activity in 2017, AGIFER had a budget of 4.621.195 lei, that is 993.805 eur (considering an exchange rate 1 € = 4,65 lei).

1.4 Organization

In 2015, through the Minister of Transports’ Order no.1178/03.11.2015 AGIFER organization chart was approved, being presented bellow:



1.5 Organization chart



2 INVESTIGATION PROCESS

The investigation aims to prevent the accidents and incidents and includes gathering and analyzing 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 the legal point of view an administrative act, allowing the main investigators to fulfill 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 object of the investigation report drafted according to the seriousness of the accident or incident.

The report presents the investigations 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, 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.

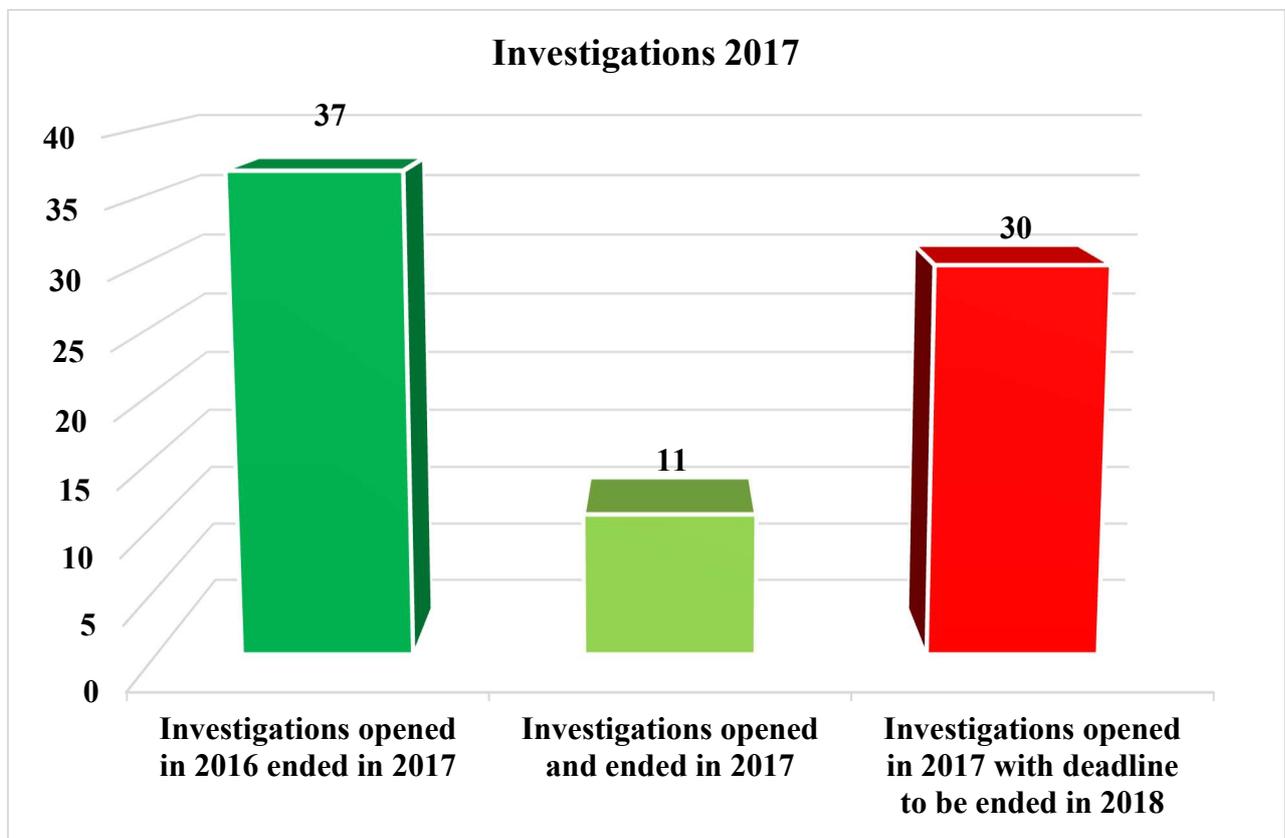
After its ending, the investigation report is submitted to the management of Romanian Railway Investigation Agency - AGIFER for the approval and publishing on its site

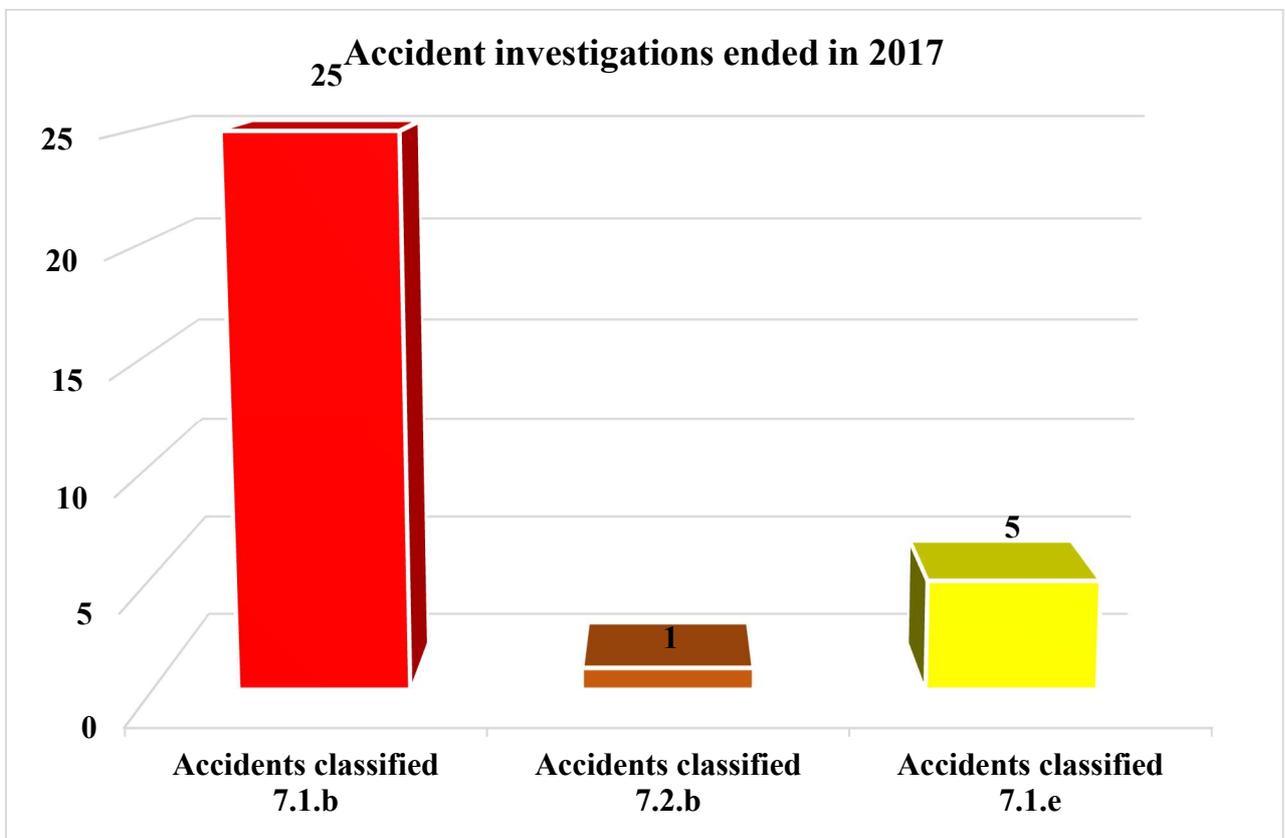
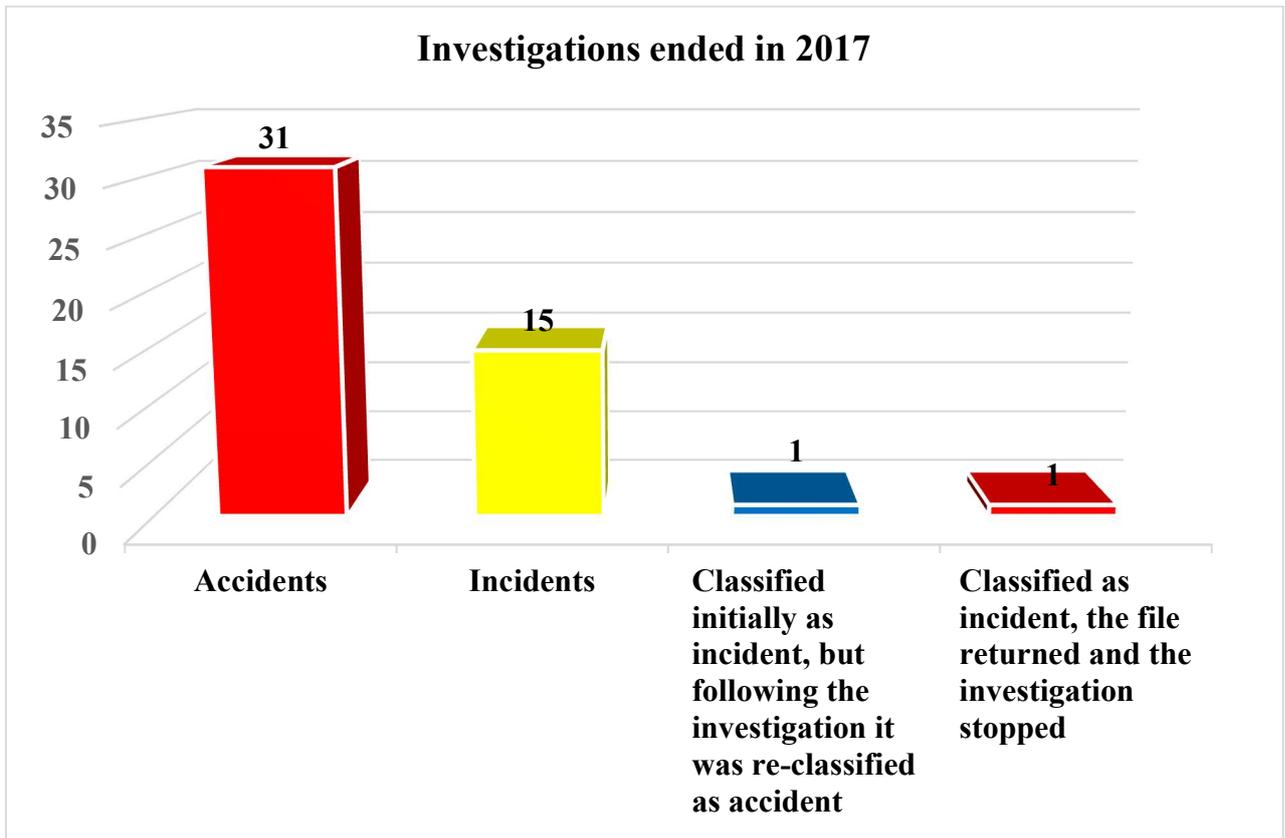
2.1 Investigated cases

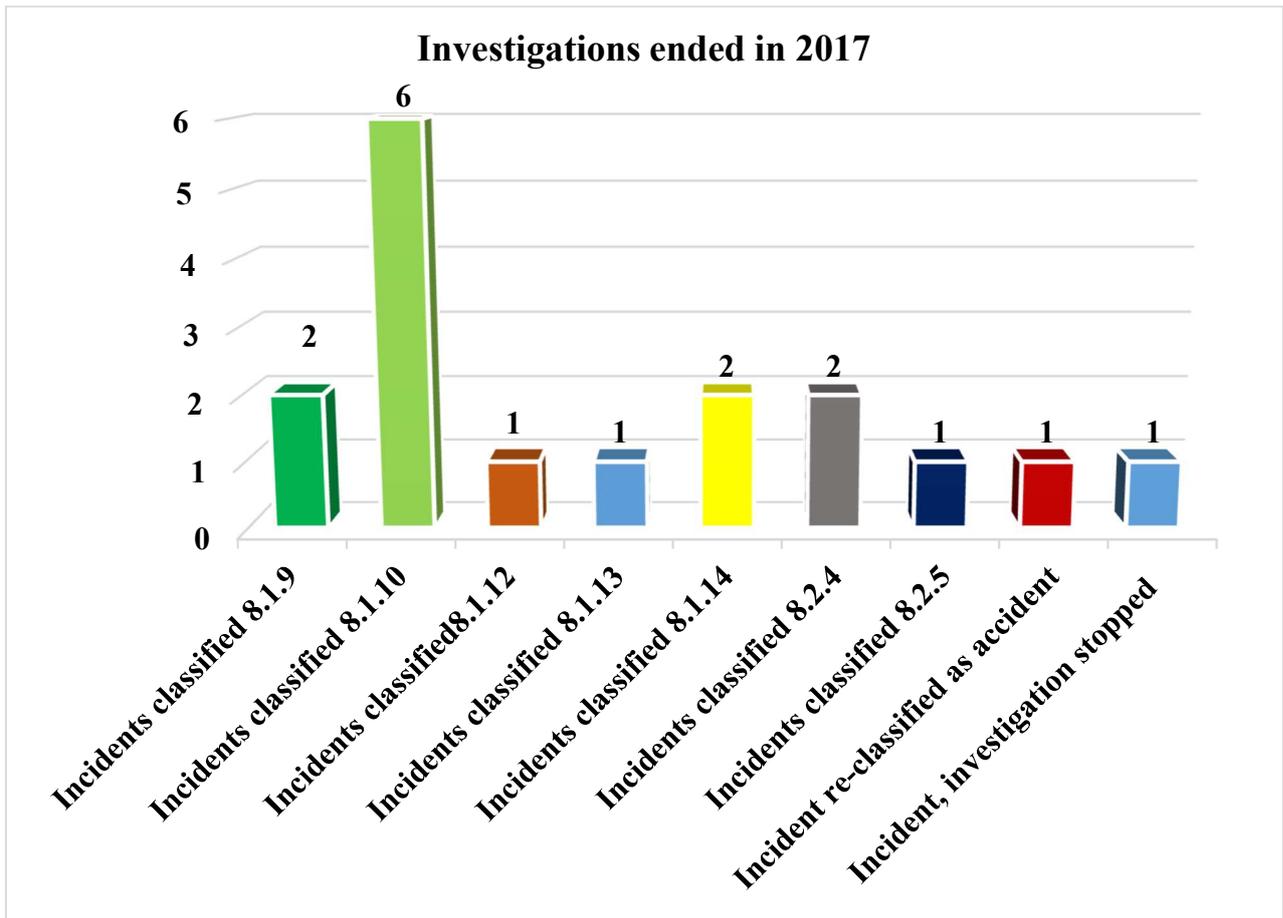
In 2017, AGIFER staff investigated **78** accidents/incidents, according to the provisions of *Law no.55/2006 on the railway safety* and of the *Regulations for investigation of accidents and incidents, for the development and improvement of Romanian railway and metro safety* approved by the *Government Decision 117/2010* – hereinafter referred to as *Investigation Regulations*. From those 78 investigations, 37 were opened in 2016, and the other ones of 41 were opened in 2017.

In 2017, one also ended and closed **48** investigations, respectively:

- 31 railway accidents;
 - 17 railway incidents, from which:
 - 12 cases classified according to the provisions of art.8.1 group A from the *Investigation Regulations*, for which Romanian Railway Investigating Agency ensured the investigator in charge. In 2 cases, following the investigation, the investigation commission did not consider that it correspond to a railway incident, according to the provisions of *Investigation Regulations*;
 - 5 cases 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. In one case, following the investigation, the investigation commission considered that it is classified as railway incident according to the provisions of *Investigation Regulations* and in another case the file was returned to the infrastructure manager CNCF „CFR” SA and the investigation stopped.





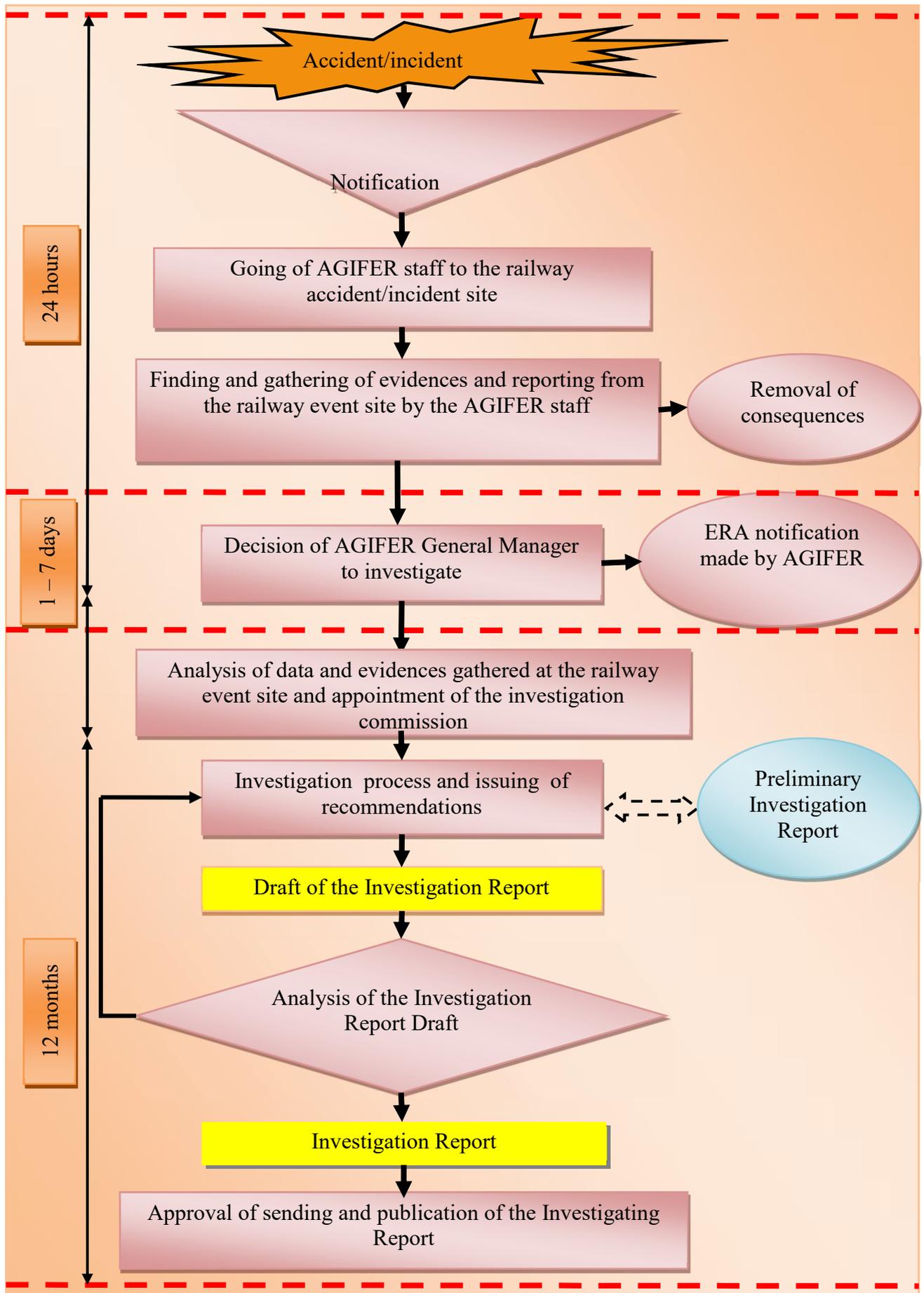


2.2 Institutions involved in the investigation (currently or exceptionally)

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 2017 there was no case of appointment of specialists outside AGIFER within the commissions for the investigation of the railway accidents

2.3 Investigation process



3 INVESTIGATIONS

3.1 Overview of the investigations ended in 2017 as against to 2016, identification of the main tendencies

| Type of the accidents investigated in 2017 ⁽¹⁾ | Number of accidents | Number of victims | | Damages (lei) | Damages (€) | Tendency of the accident number, as against to 2016 (difference between the number of cases and percentage) |
|---|---------------------|-------------------|-------------------|--------------------|---------------------|--|
| | | Deaths | Seriously injured | | | |
| Train collisions | 1 | 2 | - | 216871,06 | 46708,25 € | 0 (0%) |
| Train derailments | 25 | - | - | 2658486,05 | 584227,36 € | +8 (+47%) |
| Road vehicles hit at the level crossings | 0 | - | - | 0 | 0 | 0 (0%) |
| Fires in the rolling stock | 5 | - | - | 10104315,15 | 2213022,59 € | 0 (0%) |
| Total | 31 | 2 | - | 12979672,26 | 2843958,20 € | +8 (+35%) |

(1) one took into account the year of the investigation end;

3.2 Investigations ended and started in 2017

In 2017 Romanian Railway Investigation Agency (AGIFER) ended and closed 48 investigations (from which 37 were investigations opened in 2016) and started the investigation in 30 cases for which the investigations opened in 2017 have to be ended in 2018

In the bellow table 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.

Investigations ended in 2017

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|----------------|
| 1 | 06.02.2016 | In the railway county Cluj, track section Dej Călători - Jibou (a non-electrified single-track), in the railway station Letca, in the running of the freight train no.42691, consisting in 29 wagons (loaded with salt), hauled by the locomotives DA 931 and DA 1158, got by the railway undertaking SNTFM „CFR Marfă” SA, 10 wagons derailed. | i | 02.02.2017 |
| 2 | 08.02.2016 | In the railway county Braşov, non-interoperable track section Luduş - Măgheruş Şieu (a non-electrified single-track managed by SC RC-CF TRANS SRL Braşov), | i | 02.02.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|--|---|----------------|
| | | between the railway stations Luduș and Sărmășel , km.15+400, in the running of the passenger train Regio no.14020 (got by SC REGIOTRANS SRL Brașov), the first axle of the multiple unit AMX 1602 derailed, in its running direction. | | |
| 3 | 18.02.2016 | In the railway county Cluj, track section Măgheruș Șieu – Beclean pe Someș (electrified single-track line), between the exit signal X1 and the switch no.4 from the railway station Șintereag , in the running of the passenger train regio no.4206-1 (got by the railway undertaking SNTFC „CFR Călători” SA), the first axle of the hauling locomotive EA 670 derailed in the running direction | i | 09.02.2017 |
| 4 | 10.03.2016 | In the railway county Brașov, in the railway station Siculeni , in the running of the freight train no.83286 (got by SNTFM „CFR Marfă” SA), the first bogie of the wagon no.31534542105-3, the 4 th from the locomotive, derailed in the running direction. | i | 09.03.2017 |
| 5 | 12.03.2016 | In the railway county București, in the railway station Chitila , in the running of the freight train no.40616-1 (got by DB Schenker Rail România SRL), the last two wagons of the train derailed. | i | 20.02.2017 |
| 6 | 12.03.2016 | In the railway county Craiova, between the railway stations Strehaia and Butoiești , km 304+00, in the running of the passenger train no.9502 (got by the railway undertaking SNTFC „CFR Călători” SA), the hauling locomotive EA 329 hit a metallic joint fish plate . | iii | 09.03.2017 |
| 7 | 21.03.2016 | In the railway county Brașov, track section Brașov-Sighișoara (electrified double-track line), in the railway station Augustin , switch no.7, , the first bogie of the locomotive EA 498, hauling the passenger train IR no.1745 (got by the railway undertaking SNTFC „CFR Călători” SA), derailed in the running direction. | i | 20.03.2017 |
| 8 | 15.04.2016 | In the railway county Cluj, track section Dej Călători - Jibou (non-electrified double-track line), at the passing of the freight train no. 42619 (got by the railway undertaking SNTFM „CFR Marfă” SA) through the railway station Gâlgău , it consisting in 30 wagons, the first axle from the 25 th wagon | i | 16.01.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|----------------|
| | | derailed, in the running direction, the wagon being loaded with empty containers. | | |
| 9 | 22.04.2016 | In the railway county Cluj, track section Jibou – Carei, in the railway station Zalău Nord , in the running of the train 48402 A (got by the railway undertaking SNTFM „CFR Marfă” SA), five axles of the hauling locomotive DA 970 derailed. | i | 19.04.2017 |
| 10 | 26.04.2016 | In the railway county Craiova, in the railway station Craiova , in the running of the freight train no.39554, got by the railway undertaking Deutsche Bahn Cargo România, three wagons, the 9 th , 10 th and 11 th , loaded with crops, derailed (two of them overturned). | i | 21.04.2017 |
| 11 | 03.05.2016 | In the railway county Craiova, the track section Turceni - Drăgotești (electrified single-track line), between the railway stations Drăgotești and Borăscu , km. 39+000, in the running of the freight train no.23652 (got by the railway undertaking SNTFM „CFR Marfă” SA), both bogies of the first wagon and the first bogie of the second wagon derailed in the running direction. | i | 21.04.2017 |
| 12 | 19.03.2017 | In the railway county Craiova, on the industrial branch got by Terminal Arpechim , connected at the railway station Bradu de Sus, the first two wagons of the rake of wagons, wagons owned by the economic agent CH-VTGCH, rented from SNTFM „CFR Marfă” SA, derailed. | iii | 03.04.2017 |
| 13 | 05.05.2016 | In the railway county Craiova, in the railway station Caracal , one found out the hit of the point motor no.30 by the train no.39552, hauled with DA 1009 (got by Deutsche Bahn Cargo România). | iii | 27.04.2017 |
| 14 | 08.05.2016 | In the railway county Brașov, track section Brașov - Ploiești Vest (electrified double-track line), between the railway stations Predeal and Timișu de Sus , km.148+125, on the track I , in the running of the freight train no.33304 (got by the freight undertaking SNTFM „CFR Marfă” SA) a fire burst into the hauling locomotive EA 852. | i | 03.05.2017 |
| 15 | 21.05.2016 | In the railway county Craiova, track section Turceni – Drăgotești (electrified single-track line), in the railway station Drăgotești , at the crossing of the freight train no. 23639 | i | 19.04.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|--|---|----------------|
| | | (got by the railway undertaking SNTFM „CFR Marfă” SA) over the switch no.7, the second bogie of the 27th wagon derailed in the running direction. | | |
| 16 | 25.05.2016 | In the railway county Timișoara, track section Simeria – Hunedoara (electrified single-track line), in the railway station Pestiș , in the running of the freight train no.30638 (got by the railway undertaking Deutsche Bahn Cargo România), 11 wagons derailed. | i | 23.05.2017 |
| 17 | 28.05.2016 | In the railway county Craiova, track section Băbeni - Alunu (non-electrified single-track line), between the railway stations Alunu and Berbești , km 37+800, in the running of the freight train no.79184 (got by railway undertaking SC Grup Feroviar Român SA), the second bogie of the 15 th wagon derailed, in the running direction. | i | 23.05.2017 |
| 18 | 01.06.2016 | In the railway county Iași, between the railway stations Ruginoasa and Pașcani , one found out that 9 track magnets were hit by the locomotive EC 085 of the passenger train no. 5402-1, got by the railway county Iași | iii | 30.05.2017 |
| 19 | 14.06.2016 | In the railway county Brașov, track section Brașov - Sighișoara (electrified double-track line), between the railway stations Cața and Rupea , a fire burst into the dead locomotive EA 557, being in the passenger train Regio no. 3536, got by the railway passenger undertaking SNTFC „CFR Călători” SA. | i | 25.05.2017 |
| 20 | 22.06.2016 | In the railway county Cluj, track section Salva – Vișeu de Jos (non-electrified single-track line), between the railway stations Telciu and Coșbuc , km 12+200, in the running of the freight train no.42564 (got by the railway undertaking SNTFM „CFR MARFĂ” SA), hauled by the locomotive DA 970, two wagons derailed. | i | 14.06.2017 |
| 21 | 10.07.2016 | In the railway county București, in the railway station Bucureștii Noi , in the running of the freight train no.71706 (got by SNTFM „CFR Marfă” SA), one bogie from 2 loaded wagons, the 12 th and the 13 th ones, derailed. | i | 15.06.2017 |
| 22 | 02.08.2016 | In the railway county Craiova, in the railway stations Valea Albă , in the running of the | i | 28.07.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|----------------|
| | | freight train no.92310 (got by SNTFM „CFR Marfă” SA), the first axle of the locomotive ED 047 (the second one in the front of the train) derailed. | | |
| 23 | 05.08.2016 | In the railway county Galați, track section Buzău - Mărășești (electrified double-track line), between the railway stations Buzău and Boboc , track II, km 135+680, in the running of the passenger train no.5110 (got by SNTFC „CFR Călători” SA), a fire burst into the hauling locomotive EA 818. | i | 14.07.2017 |
| 24 | 26.08.2016 | In the railway county București, track section Videle – Giurgiu Nord (non-electrified single-track line), km 54+400, between the railway stations Târnavele and Rădulești , a fire burst into the locomotive DA614, running as train no.87232 (got by SNTFM „CFR Marfă” SA). | i | 24.07.2017 |
| 25 | 02.09.2017 | In the railway county Craiova, track section Filiași-Strehaia, in the railway station Gura Motrului , in the running of the freight train no.93756A-1 (got by the railway undertaking SNTFM „CFR Marfă” SA), the first axle of the hauling locomotive EA 130 derailed. | i | 31.08.2017 |
| 26 | 02.10.2016 | In the railway county Brașov, track section Brașov-Siculeni (electrified single-track line), between the railway stations Bicsadu Oltului and Malnaș Băi , km 54+100, in the running of the passenger train no.1642 (got by the railway undertaking SNTFC „CFR Călători” SA), the axle no. 6 of the hauling locomotive EA 014 derailed in the running direction. | i | 28.09.2017 |
| 27 | 02.10.2016 | In the railway county Craiova, between the railway stations Hârșești and Recea , one found out that 14 track magnets were hit by the locomotive DA 1191 (got by the railway undertaking SNTFC „CFR Călători” SA), hauling the passenger train Regio no.9401-2. | iii | 23.05.2017 |
| 28 | 06.10.2016 | In the railway county Craiova, in the railway station Balota , one found out that a track magnet was hit by the locomotive EA 566, got by the railway undertaking SNTFM „CFR Marfă” SA, being a dead one in the freight train no.97559. | iii | 23.05.2017 |
| 29 | 19.10.2016 | In the railway county Constanța, railway station Medgidia , in the running of the freight train no.80394, hauled by the locomotive DA 1523 (got by the railway | i | 09.10.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|--|---|----------------|
| | | undertaking SC GRUP FERVIAR ROMÂN SA), the first bogie from the 6 th wagon, loaded with cement, derailed. | | |
| 30 | 29.10.2016 | In the railway county Constanța, between the railway stations Dunărea and Cernavodă Pod , the locomotive EA 538, hauling the train no. 1581, got by the railway undertaking SNTFC „CFR Călători” SA, hit a metallic structure. | iii | 23.02.2017 |
| 31 | 13.09.2016 | In the railway county Craiova, in the railway station Caracal , the train no. 20902 (got by SC Trans Feroviar Grup SA) running with a speed of 69 km/h, exceeded the stipulated speed restriction of 30km, | iii | 23.05.2017 |
| 32 | 17.11.2016 | In the railway county Brașov, track section Gheorgheni - Deda (electrified single-track line), in the railway station Ditrău , in the area of the switch no.4 from the end Y, in the running of the freight train no.51720 (got by the railway undertaking SNTFM „CFR Marfă” SA), 4 wagons, loaded with ammonium nitrate, derailed (the both bogies of the 17 th , 18 th and 19 th wagons derailed and one bogie of the 20 th wagon derailed too) | i | 09.11.2017 |
| 33 | 23.11.2016 | In the railway county Timișoara, in the railway station Arad , during the shunting from the open line 1A to the line 12A1, occupied with 25 wagons (24 loaded with fuel and a buffer wagon at the end of the train, an empty one), the locomotive DA 352 got by the railway undertaking SC MMV Rail România, came seriously in collision with the rake of wagons, stopped, the first wagon being damaged and the second one being suspended | iii | 21.11.2017 |
| 34 | 30.11.2016 | In the railway county Craiova, in Bîrsești railway station, at the shunting of the light locomotive EA 515 for its coupling at the locomotive EC 104 from the freight train no. 81708-1, parked on the line no.5 (both of them got by SNTFM „CFR Marfă” SA) there was a serious collision between these two locomotives, leading to the death of the driver from the locomotive EA 515, the driver of the locomotive EC 104 being seriously injured and dying previously, and the next damages: | i | 27.11.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|----------------|
| | | <ul style="list-style-type: none"> - destruction of the body of the first wagon from the freight train no.81708-1; - serious damage of those two locomotives and the derailment of the first bogie from the locomotive EC 104. | | |
| 35 | 30.11.2016 | In the railway county Constanța, in the railway station Neptun , a fire burst in the multiple unit AM753, running as passenger train no.8389 (got by SNTFC „CFR Călători” SA). Following the fire the driver suffered burns on the hands and the multiple unit was about 50% damaged . | i | 22.11.2017 |
| 36 | 25.12.2016 | In the railway county Timișoara, in the railway station Șofronea , the light locomotive EA 38, running as train no. 79818 (got by MMV Romania) broke the cover for the operation and control bars from the switch no.4, of the system ELP from the switch no.3 and of the impedance bond of the section 013C. | iii | 19.12.2017 |
| 37 | 27.12.2016 | In the railway county Iași, between the railway stations Tutova and Bârlad , a part fallen from the locomotive DA 863, hauling the train no. 1831, got by the railway undertaking SNTFC „CFR Călători” SA hit the track magnets of 1000/2000 Hz and 500 Hz afferent to the signal Bl 5. | iii | 04.05.2017 |
| 38 | 30.12.2016 | In the railway county Cluj, track section Beclean pe Someș – Măgheruș Șieu (electrified single-track line), between the railway stations Beclean pe Someș and Șintereag, km.26+100, the first axle from the first bogie of the locomotive EA188, hauling the passenger train Regio no. 4107, got by the railway undertaking SNTFC „CFR Călători” SA derailed in the running direction. | i | 24.08.2017 |
| 39 | 31.12.2016 | In the railway county Brașov, track section Siculeni – Deda (electrified single-track line), between the railway stations Izvoru Oltului and Izvoru Mureșului , km.121+600, the first bogie of the trailer wagon RE 012 from the passenger train Regio no. 4504, consisting in the electric train sets RE 011 and RE 012, got by the railway undertaking SNTFC „CFR Călători” SA, derailed . | i | 19.12.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|----------------|
| 40 | 01.01.2017 | In the railway county Braşov, in the railway station Braşov Triaj , at the stabling of the freight train no.50480-1 (got by the railway undertaking SC UNICOM TRANZIT SA), hauled by the locomotives EA 212 and EA 223 (banking ones), on the line no.9, the first axle of the locomotive EA 223, derailed over the switch no.47, in the running direction. | i | 28.12.2017 |
| 41 | 14.02.2017 | In the railway county Braşov, track section Simeria - Coşlariu (electrified double-track line), in the railway station Şibot , the movements inspector made wrong the exit route for the train no.1838, got by the railway undertaking SNTFC „CFR Călători” SA. | iii | 03.04.2017 |
| 42 | 04.03.2017 | In the railway county Bucureşti, track section Titu - Târgovişte (non-electrified double-track line), at the stabling of the train no.92051 (got by the railway undertaking SNTFM „CFR Marfă” SA), on the line 7 of the railway station Târgovişte , two wagons derailed, (all axles of the 7 th wagon, both axles of of the first bogie from the 8 th wagon). | i | 18.12.2017 |
| 43 | 08.02.2017 | In the railway county Iaşi, in the railway station Suceava , the shunting signal M20 was passed in stop position by the locomotive EA 650, infringing the specific regulations, it being got by SNTFC „CFR Călători” SA, followed by the derailments of all its axles over the interdependent switch 36/48. | iii | 21.07.2017 |
| 44 | 28.03.2017 | In the railway county Craiova, track section Roşiori Nord - Videle, in the railway station Ciolpani , on the line 4, in the running of the freight train no.30559-2, got by the railway undertaking Deutsche Bahn Cargo România, consisting in 30 wagons loaded with crops, the second bogie of the 3th wagon derailed . | i | 13.12.2017 |
| 45 | 19.04.2017 | In the railway county Galaţi, track section Buzău - Adjud (electrified double-track line), in the railway station Adjud , the braked weight percentage for keeping stopped the train no.50458 was not ensured, it being got by the railway undertaking „UNICOM TRANZIT” SA. | iii | 11.05.2017 |
| 46 | 23.04.2017 | In the railway county Bucureşti, track section Bucureşti – Videle (electrified double-track line), on the track I Grădinari – Chiajna , according to DB Cargo Romania SA notification, the driver of the train no. 30602, | iii | 08.06.2017 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|----------------|
| | | got by the railway undertaking „DB Cargo Romania S.A.”, did not comply with the speed restriction of 30 km/h, situated between km. 21+900 and km. 20+400, according to the provisions from the Speed Notification Sheet – BAR. | | |
| 47 | 16.06.2017 | In the railway county Iași, on the industrial branch EGGER , 6 wagons derailed during the shunting by banking of a rake of wagons on broad-gauge line. | iii | 15.11.2017 |
| 48 | 03.11.2017 | In the activity of SC METROREX S.A. București, track section Preciziei–Anghel Saligny M3 (electrified double-track), between the stations Politehnica and Eroilor , the train 39 REM 1110-2110 was hit by a metallic construction for the collection of the infiltration water | iii | 13.11.2017 |

(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 2017, that are to be finished in 2018

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|----------------|
| 1 | 07.02.2017 | In the railway county Timișoara, track section Sânnicolau Mare – Cenad (non-interoperable track section managed by RC-CF Trans SRL Brașov), between the railway stations Sânnicolau Mare and Cenad , km.66+500, all axles of the multiple unit AMX 526 derailed and the first two axles of the trailer wagon no. 57-326-9 from the passenger train no. 14389 (got by the railway undertaking SC Regiotrans SRL Brașov), derailed too in the running direction. | i | 17.01.2018 |
| 2 | 15.02.2017 | In the railway county Cluj, track section Dej – Apahida, between the railway stations Dej and Dej Călători , km 0+690, in the running of the freight train no.50477 (got by the railway undertaking SC UNICOM TRANZIT SA), the first bogie from the 4 th wagon derailed in the running direction. | i | 12.02.2018 |
| 3 | 02.03.2017 | In the railway county Timișoara, track section Petroșani–Simeria (electrified double-track line), in the railway station Călan , km 12+700, the inductor of the locomotive EA 272, hauling the train no. 59420A, got by the railway undertaking UNICOM TRANZIT SA, hit the track magnet of 1000/2000 Hz, afferent to the entry signal Y. | 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+740, between the railway stations Halmeu and Porumbești , both axles of the first bogie from the multiple unit ADH 1421, running as passenger train no. 4408, got by the railway undertaking SNTFC „CFR Călători” SA, derailed in the running direction. | i | 12.02.2018 |
| 5 | 15.03.2017 | In the railway county Cluj, track section Baia Mare – Satu Mare (non-electrified single-track line), between the railway stations Baia Mare and Bușag , km.53+000, the rear axle from trailer wagon of the multiple unit LVT 138, got by the railway undertaking SNTFC „CFR Călători” SA, running as passenger train no. 4313, derailed. | i | 13.03.2018 |
| 6 | 27.03.2017 | In the railway county Iași, track section Iași - Pașcani (electrified double-track line), in the railway station Târgu Frumos , the movements inspector on duty made in a wrong way the entry route for the train R no.5524, got by the railway undertaking SNTFC „CFR Călători” SA. | iii | 26.03.2018 |
| 7 | 08.04.2017 | In the railway county Timișoara, track section Petroșani - Simeria (electrified double-track line), between the railway stations Bănița and | i | 03.04.2018 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|--|---|----------------|
| | | Merișor , on the track I, km.62+890, the locomotive EA 759 and the first 14 wagons of the freight train no. 50457, got by the railway undertaking SC UNICOM TRANZIT SA, derailed, leading to the death of the locomotive crew (driver, driver's assistant). | | |
| 8 | 15.04.2017 | In the railway county Brașov, track section Brașov-Sighișoara (electrified double-track line), between the railway stations Mureni and Beia , on the track 1, km 267+060, all four axles of the first bogie from the crane wagon type EDK of 250 tf, being the 4 th in the composition of the train no. 28261-2, got by CNCF „CFR” SA, derailed. | i | 12.04.2018 |
| 9 | 24.04.2017 | In the railway county Timișoara, track section Petroșani - Subcetate (electrified double-track line), between the railway stations Bănița and Petroșani , 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 28 th wagon derailed. | i | 20.04.2018 |
| 10 | 20.05.2017 | In the railway county Timișoara, track section Livezeni – Lupeni, in the railway station Livezeni , at the stabling of the freight train no.23815, got by the railway undertaking SNTFM „CFR Marfă” SA, the first bogie of the 33 rd wagon derailed, in the running direction. | i | 16.05.2018 |
| 11 | 03.04.2017 | In the railway county Craiova, in the railway station Roșiori Nord , in the shunting activity, the first bogie of the wagon no. 33530823183-6, got by the railway undertaking Deutche 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 the railway station Curtici , km.646+100, the current-collector cable of the metallic pole for the support of the contact line LC25 was hit by the door of the wagon no.33535421161-7 Eaos (the 15 th one from the locomotive) of the train no. 50419, got by the railway undertaking UNICOM TRANZIT SA. | i | 22.05.2018 |
| 13 | 28.05.2017 | In the railway county Craiova, non-interoperable track section Băbeni-Alunu, between the railway stations Berbești and Popești Vâlcea , km 27+200, a fire burst into the locomotive DA 1503, a banking one at 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 the railway station Golești , on the direct line II, in the running of the passenger train no.1872, consisting in the multiple unit AM 2053 DESIRO (got by the | i | 06.06.2018 |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|--|---|--------------------------|
| | | railway undertaking SNTFC „CFR Călători” SA), the signal YII was passed in stop position , followed by the derailment of first two bogies of the multiple unit on the line 2T, in the running direction | | |
| 15 | 08.06.2017 | In the railway county Timișoara, track section Arad-Simeria (electrified double-track line), in the running of the freight train no.90901, got by the railway undertaking SC Rail Force SRL, in the railway station Milova , km.588+000, the second bogie of the wagon no.31537887008-5, series Zaes (the 37 th one) derailed. | i | 06.06.2018 |
| 16 | 15.07.2017 | In the railway county Constanța, track section Făurei - Fetești (electrified double-track line), in the railway station Țândărei , in the running of the freight train no.61733, got by the railway undertaking SNTFM „CFR Marfă” SA, two train wagons derailed and overturned (the 29 th and 30 th ones in the running direction). | i | 11.07.2018 |
| 17 | 20.06.2017 | In the railway county Cluj, track section Apahida–Oradea (non-electrified double-track line), in the railway station Brăișoru , the multiple unit DESIRO 2019 ran away on the running line Braisoru - Poieni, up to km 561+520, rested out of service in the in the railway station Brăișoru, at the switch 16, being the train 3629, got by the railway undertaking SNTFC „CFR Călători” SA. | iii | 23.07.2018 |
| 18 | 02.09.2017 | In the railway county Brașov, track section Sfântu Gheorghe - Siculeni (electrified single-track line), in the railway station Băile Tușnad , the second bogie of the locomotive EA 078, hauling the passenger train no. 1366-1, got by the railway undertaking SNTFC „CFR Călători” SA, derailed over the switch no.1 | i | 23.08.2018 |
| 19 | 14.09.2017 | In the railway county Constanța, in the railway station Capu Midia , in the running of the freight train no.80464, got by the railway undertaking Grup Feroviar Român SA, the second bogie from the 31 st wagon derailed, in the running direction. | i | Investigation in process |
| 20 | 24.09.2017 | In the railway county Cluj, track section Cluj Napoca - Dej Călători (electrified double-track line), in the railway station Dej Călători , the hauling locomotive and those 6 wagons, forming the train no. 1765, got by the railway undertaking SNTFC „CFR Călători” SA, derailed on the exit route, line 2X. | i | Investigation in process |
| 21 | 06.10.2017 | In the railway county Brașov, in the railway station Brașov Triaș , at the stabling of the freight train no.50462, got by the railway undertaking de transport feroviar SC UNICOM TRANZIT SA, | i | Investigation in process |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|---|---|--------------------------|
| | | hauled by the locomotives EA 531 and EA 386 (banking ones), on the la line no.10 A, the first axle from the locomotive EA 386 derailed in the running direction. | | |
| 22 | 30.10.2017 | In the railway county București, at the la exit of the train IR 1714 from the line 14 of the railway station București Nord, train got by the railway undertaking SNTFC „CFR Călători” SA, the first axle from the first bogie of the locomotive EA 892 derailed. | i | Investigation in process |
| 23 | 31.10.2017 | In the railway county București, track section Ploiești Vest - Brașov (electrified double-track line), between the railway stations Comarnic and Câmpina , on the track II, km. 104+400, in the running of the freight train no.21753-2, got by the railway undertaking SNTFM „CFR Marfă” SA, there were some material leakages and smoke release from the 17 th wagons . | iii | Investigation in process |
| 24 | 08.11.2017 | In the railway county Iași, in the railway station Vicșani , the entry semaphore A _{1/2} was passed on danger, its position being „ <i>STOP without passing the signal in stop position!</i> ”, by the freight train no.56306, got by the railway undertaking SNTFM „CFR Marfă” SA. | iii | 06.02.2018 |
| 25 | 13.11.2017 | In the railway county Constanța, in the railway station Constanța Port Mol V , at the dispatching of the light locomotive EA 2002, got by the railway undertaking Deutsche Bahn Cargo România, running as train no.L 39896, on the connection line 2 track II, for Palas, its second bogie derailed on the switch Ys. | i | Investigation in process |
| 26 | 16.11.2017 | In the railway county București, in the railway station București Triaj , the movements inspector office 17, km. 0+400, switch no.23, the first bogie of the wagon nr.33817850024-9, the second one in the freight train no.70966, got by the railway undertaking MMV Rail România SA. | i | Investigation in process |
| 27 | 20.11.2017 | In the railway county Constanța, track section Ciulnița – Călărași Sud, between the railway stations Ciulnița and Călărași Nord , 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 31 st wagon derailed, in the running direction. | i | Investigation in process |
| 28 | 05.12.2017 | In the railway county Brașov, track section Brașov-Sighișoara (electrified double-track line), km 251+700, between the railway stations Cața and Rupea , a fire burst into the locomotive EC 536, hauling the freight train no.90970, got by the | i | Investigation in process |

| No. | Date of occurrence | Presentation | Legal basis of the investigation ⁽¹⁾ | Date of ending |
|-----|--------------------|--|---|--------------------------|
| | | railway railway undertaking SC RAIL FORCE SRL Braşov. | | |
| 29 | 12.12.2017 | In the railway county Braşov, track section Braşov-Sighişoara (electrified double-track line), between the railway stations Racoş and Rupea , 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 train. | i | Investigation in process |
| 30 | 13.12.2017 | In the railway county Craiova, track section Goleşti – Costeşti, between the railway stations Goleşti and Bradu de Sus , 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 | i | Investigation in process |

- (1) ⁽¹⁾ **Legal basis of the investigation:** i= According to the Safety Directive, ii= Upon the national legal basis (that cover 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) ended or ordered in 2017

Surveys ordered in 2016 and ended in 2017

| Order date | Study name (classification type, localization) | Legal basis of the investigation ⁽¹⁾ | Complementary data |
|------------|--|---|--------------------|
| 11.10.2016 | Technical expertise of the breakage section of the axle (metalographic determinations for the chemical composition and structure of the material the axle is made of and phisic-mechanic tests on the sample taken from the axle) nr.6, series no.32978, axle derailed from the locomotive EA 014, hauling the passenger train no.1642 (got by the railway underatking SNTFC „CFR Călători” SA), in the railway county Braşov, track section Braşov-Siculeni (electrified single-track line), between the railway stations Bicsadu Oltului and Malnaş Băi, km 54+100, on the 2 nd October 2016, . | i | - |

- (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 2017 and ended in 2017

| Order date | Study name (classification type, localization) | Legal basis of the investigation ⁽¹⁾ | Complementary data |
|------------|---|---|--------------------|
| | Technical expertise of the breakage section (metalographic determinations for the chemical composition and structure of the material the axle is made of and phisic-mechanic) of the axle from the wagon 31537991154-0 involved in the railway accident occurred on the 15 th July , in the railway county Constanța, track section Făurei-Fetești (electrified double-track line) in Țândărei railway station, in the running of thr freight train no.61733 (got by SNTFM ”CFR Marfă” SA) by derailling and overturning of two wagons from the train (29 th and 30 th) | | |

⁽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 2017 rested in process

| Order date | Study name (classification type, localization) | Legal basis of the investigation ⁽¹⁾ | Complementary data |
|------------|---|---|--------------------|
| 11.10.2016 | | I | - |

⁽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 ended and closed in 2017

In 2017 one finished and closed 48 investigations from which 37 were opened in 2016, the rest of 11 being opened in 2017.

Forwards, it is presented a synthetic situation of those 48 investigation reports ended and closed during 2017.

- 3.4.1 The railway accident happened on the 6th February 2016, at 00:53 o'clock, in the railway county Cluj, track section Dej Calatori – Jibou (non-electrified single-track line), in the railway station Letca, in the running of the freight train no. 42691, consisting in 29 wagons (loaded with salt), hauled by the locomotives DA 931 and DA 1158, got by the railway undertaking SNTFM "CFR Marfă" SA, consisted in the derailment of 10 wagons.

The investigation report was concluded on the 2nd February 2017.

Direct cause

The direct cause of this accident is the wheel of the 6th wagon hit a part of the small rail section introduced into the expansion joint between the protection rail PT1 and the protection rail PT2 of the joint non-welded track, left track in the direction of the km increase, followed by the overclimbing of the rail head by the wagon wheel.

Under the dynamic forces of the rolling stock, the small rail broke in two pieces, the upper part, following the shocks received from the rolling stock, left out vertically and was hit by the left wheel of the 6th wagon, leading to the its derailment and the derailment of other 10 wagons.

Contributing factors

The unsuitable handling of the composition of the unit „joint”, km 98+985, left side in the train running direction, between the first protection rail and the second one, at the end of the "breathing" area (the welded track where the axial stresses are variable), that did not take into account that the point from km 98+985 had to be handled as a "weak" point, for which one should establish conditions that regulate the way to perform railway traffic.

Underlying causes

The lack of scheduling and performance of the works for the rectification of the expansion joints on the track section involved in the accident, works imposed following the expansion joint values were out of accepted tolerances.

Infringement of the provisions of art.10F, point 1 from *Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge no.314/1989*, on the measures to be taken for the ensurance of the rails against the moving in longitudinal direction "run away".

Infringement of the provisions of *Instruction for the composition, maintenance and surveillance of the welded track no.341/1980*, concerning the sizes of the protection rails from the end of the "breathing" areas of the welded track sections and of their adjoining expansion joints.

Root causes

1. Non-identification as hazard and lack of control of the risks afferent to the keeping in operation of some expansion joints with values over the accepted tolerances.
2. Infringement of the provisions from the Operational procedure code: PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevants within the whole life time of the lines in the maintenance processes”, concerning the rhythmic supply with the quantities of materials necessary for maintenance.
3. Non-application of the provisions from the Instruction for the track maintenance – approved by the Order 1274/1981, document associated to the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant within the whole life time of the lines in the maintenance process”, part of the safety management system of CNCF „CFR” SA, on the sizing of the staff from the subunits 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.5 Băbuțeni within Section L7 Dej.

4. Non-application, on the track section involved in accident, of the provisions from the operational procedure code *PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant within the whole life time of the lines in the maintenance process”*, part of the safety management system of CNCF „CFR” SA, with reference to the identification and schedule of the maintenance performance.

Safety recommendations

Taking into account that the derailment was based on causes and factors generated by 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 to issue some safety recommendations.

- 3.4.2 The railway accident happened on the 8th February 2016, at 18:00 o'clock, in the railway county Braşov, track section Luduş - Măgheruş Şieu (non-electrified single-track line, managed by SC RC - CF TRANS SRL Braşov), between the railway stations Luduş and Sărmăşel, km 15+350, in the running of the passenger train Regio no.14020 (got by SC REGIOTRANS SRL Braşov), consisted in the derailment of the first axle from the multiple unit type AMX 1602.

The investigation report was concluded on the 2nd February 2017

Direct cause

The direct cause of the accident is the loose of the guiding capacity of the track at km 15+350, that led to the fall of the right wheel of the guiding axle from the multiple unit type AMX, that was the passenger train no.14020, followed by the overclimbing of the rail head from the exterior track of the curve by the left wheel of the same axle and its fall outside the track.

It happened because the increase of the gauge value over the maximum accepted value, because the lateral movement of the rail of the exterior track of the curve under the dynamic forces sent by the rolling stock to the track.

Contributing factors:

Keeping of sleepers that did not ensure the fastening of rails and maintaining of the gauge between the accepted limits.

Underlying causes:

- infringement of the provisions from the art.25 of the Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989, with reference to the failures that impose the replacement of the wooden sleepers;
- non-application of the provisions from art.3 – paragraph 3 from the Sheet no.4 of the Instruction no.305/1997 „concerning the establishment of terms and order for the check inspections”.

Root cause

Root cause of this accident is the partial application of the provisions from:

- process procedure code PP-63 Edition: 2 Revision: 1 from the 1st of June 2015 - „Maintenance of the railway infrastructure” – Flow chart of the process for the track diagnosis and work receptions;
- practice codes used by the railway infrastructure manager (instructions for the track maintenance).

Safety recommendations:

Derailment of the multiple unit type AMX, that was the passenger train no. 14020, happened because the increase of the gauge value over the maximum accepted value, because the unsuitable maintenance of the track superstructure in the derailment area.

The investigation commission considers that the complete non-observance of the provisions from the Process procedure code PP-63 63 Edition: 2 Revision: 1 from the 1st of June 2015 - „Maintenance of the railway infrastructure” – Flow chart of the process for the track diagnosis and work receptions, part of the safety management system of SC RC-CF TRANS SRL Braşov, as well as of those from

the practice codes used by the railway infrastructure manager, led to the unsuitable condition of the track geometry in the derailment area.

Taking into account the contributing factors, factors based on the 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 to issue some safety recommendation.

3.4.3 The railway accident happened on the 18th February 2016, at 13:12 o'clock, in the railway county Cluj, track section Măgheruș Șieu – Beclean pe Someș (electrified single-track line), between the exit signal XI and the switch no. 4 from the railway station Șintereag, in the running of the passenger train regio no.4206-1 (got by the railway undertaking SC SNTFC „CFR Călători” SA) consisted in the derailment of the first axle from the hauling locomotive EA 670, in the running direction.

The investigation report was concluded on the 9th February 2017.

Direct cause:

Direct cause of this accident was the loss of the guiding capacity of the first axle from the locomotive, through the fall of the left wheel between the rails, followed by the overclimbing of the head of the right rail by the flange of the wheel of the same axle.

Contributing factors:

The unsuitable technical condition of the sleepers that, under the dynamic forces of the rolling stock wheels, sent to the fastening elements of the metallic plates, could not ensure the keeping of the track gauge between the tolerances.

Underlying causes

Infringement of the provisions from the 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”*, on the failures that impose the replacement of the wooden sleepers and non-keeping of the unsuitable sleepers.

Root causes:

Non-application of the provisions from the annex 2 of the operational procedure code PO SMS 0-4.07 *“Meeting with the technical specifications, standards and requirements relevant for whole life cycle of the lines in the maintenance processes”*, part of the safety management system of CNCF “CFR” SA, on the replacement of the unsuitable wooden sleepers.

Measures taken

During the investigation, in order to prevent some similar accidents, the Railway County Cluj of CNCF „CFR” SA took the measure to close the railway traffic on the line no.1 from the railway station Șintereag and performed consolidation of this line through the replacement of the unsuitable sleepers.

In these conditions, the line no.1 of the railway station Șintereag was closed between the 18th of February and the 31st of March 2016, during this period of time 250 unsuitable wooden sleepers being replaced.

Safety recommendations

ASFR shall be sure that the public railway infrastructure manager – CNCF “CFR” SA, in the maintenance of the railway infrastructure, shall identify and permanently control the risks associated to the hazard generated by the lack of materials necessary to perform the railway infrastructure maintenance.

3.4.4 The accident happened on the 10th March 2016, at about 09:15 o'clock, in the railway county Brașov, in the railway station Siculeni, in the running of the freight train no.83286 (got by the railway undertaking SNTFM „CFR Marfă” SA) consisted in the derailment of the first bogie of the wagon no.31534542105-3, the 4th of the train, after the locomotive, in the running direction.

The investigation report was concluded on the 9th March 2017.

Direct cause

The direct cause of the accident is the hit and overclimbing of the check rail on the direction I, corresponding to the common crossing from the switch no.60 of the double diamond crossing with slips TJD nr.60/64, in the railway station Siculeni, by the left wheels from the first bogie in the running direction of the wagon no.31534542105-3. It happened following the dynamic increase of the gauge value, cumulated with the fact that, the widening of the trough from the end of the check rail from the same direction, at the common crossing of the same switch, had a smaller value than that established by the manufacturer of the switch

Contributing factors:

- change of the widening of the trough at the end of the check rail from the common crossing from the direction I of TJD nr.60/64, through putting plates for the adjustment of the trough widening, without knowing their use way;
- change of the length of the curved stock rail of the direction I- of TJD no.60/64, of the running rail from the check rail of the direction I at the common crossing of the switch no.60, as well as of the shape and sizes of the metallic plates at the right joint (towards the running direction of the train) from the end of the right stock rail of the direction I;
- unsuitable technical condition of some special wooden sleepers, that did not allow the fastening of the coach screws for the fastening of the metallic plates on sleepers at:
 - *the first support of the check rail from the direction I (left support, towards the running direction of the train, from the toe of switch diamond of the switch no.60) of TJD no.60/64;*
 - *right joint (towards the running direction of the train) from the end of the right stock rail of the direction I.*

Underlying causes of the accident:

- infringement of the provisions from art.15, point 11 and from art.19 point 2 from the Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge no.314/1989, concerning the non-acceptance of the unsuitable sleepers within the switches, respectively at the tolerances accepted in the operation of the switches;
- infringement of the provisions from point 4.4.1 from the Instruction for work code I 05.00.00-15 for fitting, operation and maintenance of switches type 49 E1, 60 E1 and R65, drawn up by the manufacturer of the switch no.60/64, concerning the conditions that impose the replacement of the switch sub-assemblies;
- infringement of the provisions from chapter 5 of the Instruction for work code I 05 00.00-22 for the operation and maintenance of the running rails with stock rails type „U”, drawn up by the manufacturer of the switch no.60/64, concerning the measures that have to be taken for a unsuitable guiding distance.

Root cause

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 CNCF „CFR” SA, with reference to:

- managing of the activities for maintenance and periodical repairs of the lines;
- ensuring of the materials, labour force and training of the staff, necessary to perform current maintenance and periodical repair.

Safety recommendations

The derailment of the wagon no.31534542105-3, of the freight train no.83286, happened because the overclimbing of the check rail from the direction I, at the common crossing of the switch no.60, within the double diamond crossing with slips no.TJD 60/64.

It was generated by:

- unsuitable technical condition of the parts of the track superstructure, change of the geometry of TJD no.60/64 and improvisations within the switch, the staff in charge with the railway

infrastructure maintenance in the railway station Siculeni, in order to prevent the movement of the metallic plates on the wooden sleepers, through the coach screws;

- keeping of the speed restrictions of 15 km/h over the switches from the end Y of the groups B and D in the railway station Siculeni, applied in 2008.

Taking into account it, as well as that the factors contributing the accident are based on the underlying causes, that are deviations from the practice codes, and considering that all of these are the attribute exclusive of the infrastructure manager (as it is stipulated also in the Regulations EU no.1078/2012) the investigation commission does not consider necessary to issue some safety recommendations.

During the investigation, the investigation commission found out that the management of the infrastructure manager, at regional and central level, did not identify solutions in order to impose measures viable for the supply, in sufficient quantities, of the materials necessary to replace the unsuitable ones, kept in operation, as well as in order to ensure the labour force necessary to perform the maintenance and periodical repair of switches. It consists in the lack of identification and management of risks in its own activity.

So, the public railway infrastructure manager, if it has applied its own procedures of the safety management system, completely, as well as the provisions of the practice codes, part of SMS, it could improve the railway safety and prevent the occurrence of this accident.

3.4.5 The railway accident happened on the 12th March 2016, at 21:02 o'clock, in the railway county București, in the railway station Chitila, in the running of the freight train no.40616-1 (got by the railway undertaking DB Schenker Rail Romania SRL), consisted in the derailment of the rear two wagon, no.43714378439-9 and no.43714378598-2.

The investigation report was concluded on the 20th February 2017.

Direct cause:

Direct cause of the accident is the lost of the guiding capacity of the track at km 1+985, on the running line, track II, between the branch line Rudeni and the railway station Chitila.

Contributing factors:

Unsuitable maintenance of the track superstructure.

Underlying cause

Infringement of the provisions from the Instruction of norms and tolerances for the construction and maintenance of the track – line with standard gauge no. 314/1989, concerning the composition of the welded track.

Root causes

- non-application of the provisions from the Instruction for the maintenance of the lines 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, for the sizing of the staff from Line District no.5 Chitila, within Track Section L2 București, in relation to the works.
- non-identification of the hazards generated by the unsuitable supply with some materials necessary for the track maintenance(that is of the standard wooden sleepers).

Safety recommendations

With reference to the accident happened in the running of the freight train no.40616-1, got by the railway undertaking DB Schenker Rail Romania SRL (now Deutsche Bahn Cargo Romania SRL), one found out that the wagon derailment happened following:

- keeping in operation of a superstructure unsuitable composed;
- under-sizing of the staff from the sub-units for the maintenance of the lines of the Railway County București;
- unsuitable supply with some materials necessary for the track maintenance (that is of the normal wooden sleepers).

Taking into account the causes of the accident occurrence, involving 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 to issue safety recommendations.

3.4.6 The railway incident happened on the 12th March 2016, at about 6:00 o'clock, in the railway county Craiova, between the railway stations Strehaia and Butoiești, km 304+00, in the running of the passenger train no. 9502 (got by the railway undertaking SNTFC „CFR Călători” SA), consisted in the hit of a metallic joint fish plate by the hauling locomotive EA 329.

The investigation report was concluded on the 9th March 2017.

Direct cause:

The direct cause of the railway incident was the affecting of the structure clearance by the metallic fish plate type 65, put inside the track, on the right side in the running direction of the train.

Contributing factors

- breakage through shear of those 3 horizontal screws type PM 27x170, that were ensuring the fastening of the fish plate type 65 at the joint from the right side of the track, having as reference the train running direction, at km 304+000, track II of the line București Nord-Timișoara Nord-track section Filiași – Orșova.
- the existence of a muddy area in the broken stone prism, that generated, under the dynamic effect generated by the rolling stock in running, frequent vertical movements of the joint assembly, affecting the mechanical resistance at shear of those 3 horizontal screws type PM 27x170, that ensure the fastening of the fish plates.

Underlying causes

- infringement of the codes for good practices, with reference to the railway superstructure maintenance;
- infringement of the provisions of the Minister of Transports' Order 490/2000, Annex 1- "Instructions on the dealing with the failures of some railway critical products under warranty" – 906, art. 4(1); with reference to the small fastening parts supplied and used for the fastening of the fish plates.

Root causes

None.

Additional remarks

During the investigation, a series of deficiencies was identified, without connection with the incident occurrence:

- in "Contract for the supply of horizontal screws with nut" no.138/06.10.2014 concluded between Compania Națională de Căi Ferate "CFR" SA and SC GINARD COM SRL Târgu Jiu, Chapter 8, point 8.4 is:

The supplier shall manufacture the products of materials with the characteristics in accordance with....

From the supplied documents results that the supplier just marketed the railway critical products, object of this contract, these were manufactured by another company;

- in "Contract for the supply of horizontal screws with nut" no.138/06.10.2014, concluded between Compania Națională de Căi Ferate "CFR" SA and SC GINARD COM SRL Târgu Jiu, Chapter 13, point 13.13 is:

- (1) *The supplier shall to guarantee through warranty certification that none of the products supplied upon contract has any failure following the design, materials or manpower or any other actions or omission of the Supplier and that these products meet with the requirement specification..*
- (2) *Warranty time is 5 years, granted by the Supplier for the products, excepting the supplying year..*

From the documents supplied does not result that the Supplier, SC GINARD COM SRL, issued quality certificates for the supplied products, these being issued by the manufacturer, SC

ORGANE DE ASAMBLARE SA. The conformity statements endorsed by the technical inspection AFER;

- in "Contract for the supply of horizontal screws with nut" no.138/06.10.2014, concluded between Compania Națională de Căi Ferate "CFR" SA and SC GINARD COM SRL Târgu Jiu, Chapter 17, point 17.1 is:

"The supplier shall not conclude contracts with the sub-contractors"

This point was not met with, the supplier of the railway products being in a contract relationship with their manufacturer.

Measures taken

Following the railway incident, the running line Butoiești – Ciochiuța, track II was closed from 06.32 o'clock for the removal of the non-conformities, the staff in charge with the line maintenance re-put the fish plate in the constructive position and ensured the fastening at the joint, replacing the cut horizontal screws with new ones, the line being opened for traffic at 07.06 o'clock, with the same speed restriction of 70 km/h, from km 303+850 to km 304+100.

Up to the end of the investigation report, no other measures were established by the involved parties.

Safety recommendations

Taking into account that the incident occurrence is based on causes and factors generated by 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 to issue safety recommendations.

3.4.7 The railway accident happened on the 21st March 2016, at 09:55 o'clock, in the railway county Brașov, track section Brașov – Sighișoara (electrified double-track line), in the railway station Augustin, switch no.7, consisted in the derailment of the first bogie of the electric locomotive no. 498, hauling the passenger train IR no.1745 (got by the railway undertaking SNTFC „CFR CĂLĂTORI” SA).

The investigation report was concluded on the 20th March 2017.

Direct cause:

The direct cause of the accident is the track gauge, with values over the tolerances accepted in operation, for switches, respectively on the cross-over 3-7 from the railway station Augustin, that is, while the first axle ran on a track section with widened gauge (1449 mm), the last axle ran on a track section with a gauge narrowed (1426 mm).

It led to a bad guiding of the last axle (to the running direction) of the locomotive, sent to the guiding axle (first axle of the first bogie from the locomotive) through the transverse coupling, it limiting the guiding capacity and radial orientation in curve, of the guiding axle, generating its derailment. The limitation of the guiding capacity happened during the speed increase, without this speed increase be a decisive factor of the accident.

Contributing factors:

The special wooden sleepers from the group of switches 3-7 that had longitudinal cracks.

Underlying causes

- infringement of the art19.2 from Instruction of norms and tolerances for the construction and maintenance of the track – lines with standard gauge - no.314/1989 concerning the tolerances accepted against the gauge established for switchese.
- infringement of the provisions from art.25, point 4 from Instruction of norms and tolerances for the construction and maintenance of the track – lines with standard gauge - no.314/1989, concerning the non-acceptance of the unsuitable sleepers within the switches.

Root causes

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

Safety recommendations

The derailment of the hauling locomotive of the passenger train IR no.1745 happened because the unsuitable maintenance of the group of switches 1-3-5-7 from the end X of the railway station Augustin, that led to the keeping in operation of the track superstructure with:

- unsuitable sleepers in the area limited by the diamond of the group of switches and the tip joint of the common crossing of the switch no.7;
- the values of gauge over the accepted tolerances (at the double crossing of the group of switches, from the switch no.7);

During the investigation, the commission found out that the management of the infrastructure manager, at central and county level, did not identify and manage the risks generated by the non-providing with the materials, in order to dispose of solutions and measures viable for keeping under control the derailment danger.

So, if the public railway infrastructure manager had applied its own procedures of the safety management system, entirely, as well the provisions of the practice codes, part of SMS, it should be able to improve the railway safety and to prevent the occurrence of this accident.

Taking into account the issues above mentioned and that the factor that contributed to the occurrence of the accident is based on underlying causes, consisting in deviations from the practice codes, these being completely in charge of the infrastructure manager (as it is stipulated in UE Regulations no.1078/2012), the investigation commission does not consider necessary to issue some safety recommendations.

3.4.8 The railway accident happened on the 15th of April 2016, at 5:09 o'clock, in the railway county Cluj, track section Dej Călători - Jibou (non-electrified double-track line), at the passing of the freight train no.42619, consisting in 30 wagons (got by the railway freight undertaking SNTFM „CFR Marfă” SA) through the railway station Gâlgău, consisted in the derailment of the first axle of the 25th wagon, loaded with empty containers, in the running direction

The investigation report was concluded on the 16th January 2017.

Direct cause:

Direct cause of this accident is the guiding axle (no. 1) of the first axle from the wagon no.31533556277-5 overclimbed the rail next to the common crossing of the switch no.9 from the double diamond crossing with slips TJD nr.5/9. The overclimbing of the rail by the guiding wheel happened because the fall of the first brake beam and hit of the check rail next to the common crossing.

Contributing factors:

- keeping in traffic of the wagon no.31533556277-5 with failures at the the brake rigging (joint bolt at the bogie frame missing – brake beam hanger, safety stirrup-piece of the brake beam broken) that could generate the fall of its parts.
- the position of the bogie frame joint – brake beam hanger and of the fastening of the safety stirrup-piece on the bogie frame, position that makes difficult the finding of some failures during the technical inspections.

Underlying causes:

Infringement of the provisions of art.87, table 8 – „failures and wears at the braking device” from Instructions for the technical inspection and maintenance of the wagons in operation no.250/2005 concerning the withdrawal from traffic of the wagons with failures and missing parts at the brake rigging.

Root causes:

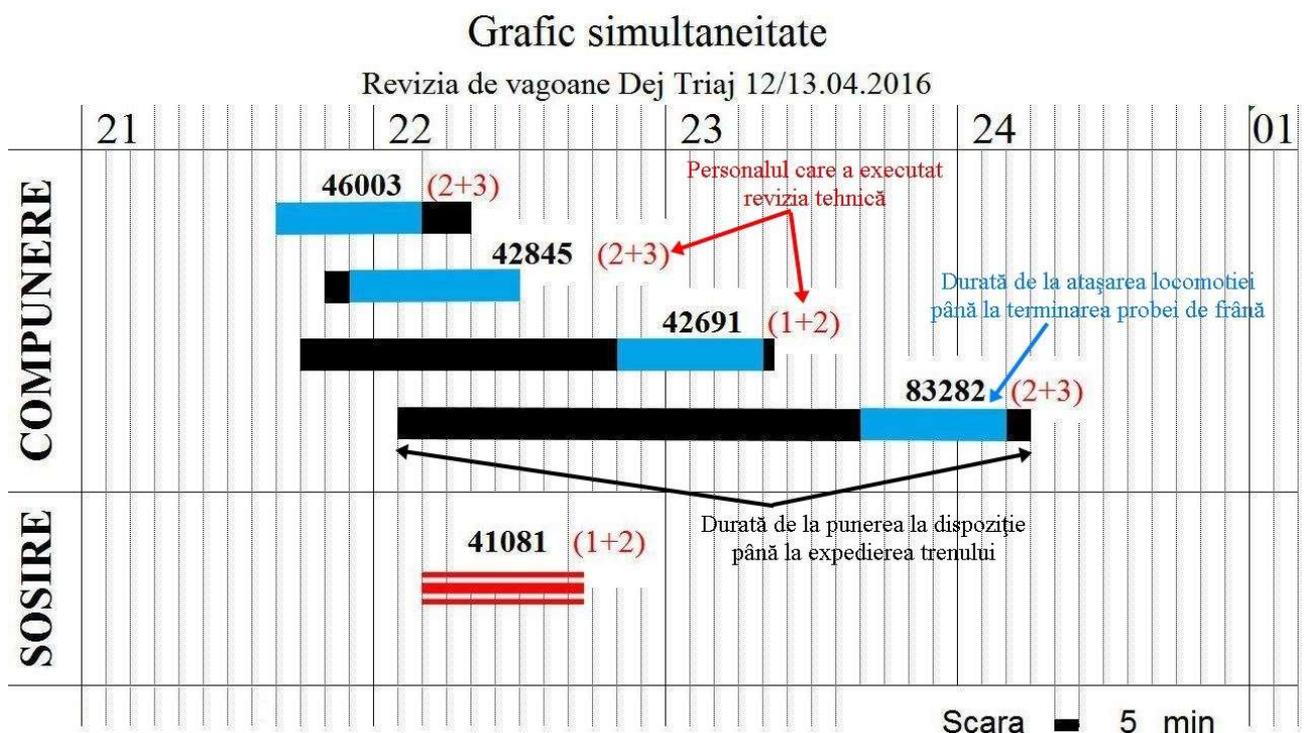
Non-application of the provisions of the operational procedure code PO 75.6 „Activities in railway stations” that has as associated document Instructions for the technical inspection and maintenance

of the wagons in operation no.250, concerning the finding and handling of the wagons with failures and missing parts at the brake rigging.

Additional remarks

During the investigation, the next findings concerning some deficiencies and lacks resulted, non relevant for the conclusions on them:

- in the Wagon Inspection Point Dej Triaj, within the shift from the 12th/13th of April 2016 there were present on duty 1 shift head (authorized to perform the tasks of the examiner) and 2 examiners. This staff between the hours 21:40 ÷ 00:15 had to perform the technical inspection 4 trains, stipulated with technical inspection during the forming and 1 train with technical inspection at its arrival. As one can see in the simultaneity chart this staff had to perform simultaneously the technical inspection at a lot of trains, the highest work load being for the examiner mentioned in the register „Inspected trains” position no.2.



Safety recommendations:

With reference to the accident happened in the running of the freight train no.42619, one found out that the braking beam of the wagon no.31533556277-5 detached and fell because keeping in traffic of this wagon with failures at the brake rigging, that can generate the fall of its parts.

Taking into account these above mentioned, the investigation commission considers necessary to issue a safety recommendation for Romanian Railway Safety Authority – ASFR that is, it makes sure that, SNTFM „CFR Marfă” SA, as railway freight undertaking re-assesses its prevention measures for keeping under control and decrease of the risks associated the technical inspection and maintenance of the wagons in operation.

- 3.4.9 The railway accident happened on the 22nd April 2016, at 2:20 o'clock, in the railway county Cluj, track section Jibou – Carei, in the railway station Zalău Nord, in the running of the freight train no.48402 A (got by the railway undertaking SNTFM „CFR Marfă” SA), consisted in the derailment of five axles of the hauling locomotive DA 970.

The investigation report was concluded on the 19th April 2017.

Direct cause:

The direct cause of the accident was the overclimbing of the rail from the exterior side of the curve by the leading wheel (first on the right side in the running direction) of the locomotive DA 970, because the exceeding of the stability limit over which the derailment can happen.

The exceeding of the stability limit, over which the derailment can happen, was possible following some increased friction coefficients wheel/rail, following some increased friction forces between the body and the bogie, as well as because the leading axle could not run radially on the curve.

Contributing factors:

- putting in operation, after the reprofiling through turning, of the wheels with roughness over the acceptable one on the running surface;
- keeping in operation of the locomotive, without ensuring the corresponding lubrication in the support points of the body on the bogies.

Underlying causes:

- non-application of the provisions NTF 81-002:2004, concerning the roughness maximum accepted on the running surfaces of the wheels;
- unsuitable application of the provisions „Lubrication instruction” within „Instruction for the operation of the Diesel-Electric locomotive of 2100 HP 060-DA”, concerning the lubrication method that has to be applied at „Lateral supports of the locomotive body”.

Root causes:

None.

Safety recommendations

Taking into account that the derailment happened because causes and factors generated by deviations from the practice codes, as well as that, the monitoring of the economic operators from the railway field is the responsibility 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 26th April 2016, at about 11:05 o'clock, in the railway county Craiova, in the railway station Craiova, in the running of the freight train no.39554, got by the railway freight undertaking Deutsche Bahn Cargo România SRL, consisted in the derailment of three wagons, loaded with cereal, that is the 9th, the 10th and the 11th (two of them overturned).

The investigation report was concluded on the 21st April 2017.

Direct cause

Direct cause of the accident is the unsuitable geometry of the track, that within the switch no.71, on the deflecting section, had values over the tolerances accepted in operation for the gauge.

Contributing factors

- keeping of unsuitable special wooden sleepers within the switch, that could not ensure an active fastening, it leading to the exceeding of the tolerances accepted for the gauge;
- big distances, non-instructional between the switch stop and curved point, that allowed the lateral movement of this point switch, that under the dynamic forces sent to the rails by the wheels of the rolling stock, in the direction of the increase (widening) of the track gauge
- undersizing of the staff number from the Track District no.1 Craiova, district that ensure the maintenance of the railway infrastructure in the railway station Craiova;
- insufficient quantities of materials for the maintenance and repair of lines and switches from the railway station Craiova;

Underlying causes

- Infringement 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 wooden sleepers and rejection of unsuitable sleepers within the switches;

- Infringement of the provisions of art.19, point 11 from „Instruction of norms and tolerances for the construction and maintenance of lines with standard gauge no. 314/1989”, concerning the distance between switch stop and curved point;
- Infringement of the provisions of the point 4.1 from Chapter 4 „Norms of manpower and material consumption”, of „Instruction for the line maintenance no.300/1982” concerning the ensurance of the norm of manpower for the current manual maintenance;

Root cause

Non-application of all provisions of the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and relevant requirements within the whole life cycle in the maintenance process” (including the annexes), part of the safety management system of the public railway infrastructure manager CNCF „CFR” SA, with reference to:

- coordination of the maintenance and periodical repair of the lines;
- ensurance of the material basis and of the manpower for the current maintenance and periodical repair.

Additional remarks

During the investigation one identified problems without relevance for the accident causes :

- on did not update the data of IVMS equipment concerning: number of the hauled train, tonnage, number of axles, code of the drivers and the box with the locomotive number (in this box it is wrong written down no.1048D instead no.1703D);
- in the running of the freight train no.39554, one did not meet with the speed restriction of 15km/h stipulated in BAR (sheet for the notification of the speed restrictions) at the passing over the diamond crossing TJD 75/79 in the railway station Craiova;
- in the route sheet series D1 no.1732 one wrote down wrong the stop of the freight no.39554 at 11:07 o'clock, respectively its departure at 11:10 o'clock in front of the entry signal from the railway station Craiova;
- when the accident happened, the railway freight undertaking DB Schenker Rail România SRL, that starting with the 7th of April 2016 became Deutsche Bahn Cargo România SRL had not updated the safety certificates in accordance with the new name.

Safety recommendations

The derailment of the wagon no. 33530843052-9, the 10th in the composition of the freight train no.39554, happened because the unsuitable maintenance in the area of the switch no.71.

During the investigation, the investigation commission found out that the management of the infrastructure manager, at central and regional level, did not identify and manage the risks generated by the non-supplying of the material basis and manpower necessary for the maintenance, so it can establish the solutions and measures valid for keeping under control the derailment hazard.

So, if the public railway infrastructure manager should apply its own procedures of the safety management system, completely, as well as the provisions of the practice codes, part of SMS, could keep the technical parameters of the track geometry between the tolerances imposed by the railway safety and prevent the occurrence of this accident.

Taking into account the presented as well as that the factors contributing to the accident occurrence have as basis the deviations from the practice codes, the compliance with them being the exclusive obligation of the infrastructure manager (as it is stipulated in the Regulations EU no.1078/2012), the investigation commission does not consider necessary to issue some safety recommendations.

3.4.11 The railway accident happened on the 3rd of May 2016, at about 17:50 o'clock, in the railway county Craiova, track section Turceni - Drăgotești (electrified single-track line), between the railway stations Drăgotești and Borăscu, km 39+041, in the running of the freight train no.23652, (got by the railway undertaking SNTFM „CFR Marfă” SA) consisted in the derailment of the both bogies of the first wagon and of the second one, in the running direction

The investigation report was concluded on the 21st April 2017.

Direct cause:

Direct cause of the accident is the fall of the left wheel (wheel no. 7) of the leading axle, from the wagon no. 81536655144-9, first of the freight train no. 23652, between the rails. It happened because the unsuitable composition of the track superstructure, allowing the metallic plates movement in the direction of the track gauge increase, and the train wagons were overloaded.

Contributing factors:

- overloading of the wagons from the composition of the freight train no.23652.
- keeping in operation of 4 consecutive sleepers, that did not have the metallic plates fastened with screws at the end from the exterior rail of the curve, in order to stop their movement and implicitly to ensure the accepted tolerances for the track gauge;
- undersizing of the worker number existing at the Track District no.6 Turceni, staff that ensure the maintenance of the railway infrastructure at the accident site;
- supplying of insufficient materials for the performance of maintenance and repair of the running line between the railway stations Drăgotești-Turceni;

Underlying causes

- Infringement of the provisions from art.25, paragraphs (2) and (4) of „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 wooden sleepers and keeping in line of unsuitable sleepers;
- Infringement of the provisions from point 4.1 of Chapter 4 „Norms of manpower and material consumption”, from the „Instruction for the maintenance of the lines no.300/1982” for the ensurance of the manpower norm for the current manual maintenance ;
- Loading of wagons from the composition of the freight train no.23652, non-meeting with the provisions of points 3.1 și 3.2 from the Annex II RIV, concerning the maximum load on axle and the loading limits.

Root causes

- non-application of all provisions of the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and relevant requirements within 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 sub-units for the line maintenance, in relation to the works and ensurance of the material basis;
- non-application of all provisions from the operational procedure code PO 431-SMS „Identification and assessment of the risks associated to the railway safety” Edition 1, Revision 00 from 2011, part of the safety management system of SNTFM „CFR Marfă” SA, concerning the identification and assessment of the risks induced by the over-taking/handing over of the wagon consignments from/to the consignor, performed in the sub-units of the railway county Banat-Oltenia.

Additional remarks:

During the investigation, between km 39+000-40+000 (area that includes the derailment site) one identified on the left site, to the train running direction, a non-instruction joint within the welded track, without relevance for the conclusions on the accident causes, as follows:

Concerning the composition and evidence of the welded track

- composition of the welded track at km 39+000-40+000 does not comply with the provisions of the Instruction for the composition, maintenance and surveillance of the welded track no.341/1980 and of the Instruction of norms and tolerances for the track building and maintenance – lines with standard gauge - no.314/1989, because the joints within the left rail, train running direction, were different as number and position from those on the right rail;
- the presence of joints within the welded track at km 39+000-40+000, presented in the sheet of the welded track, drafted in accordance with the provisions of Annex 5 of the Instruction for the composition, maintenance and surveillance of the welded track no.341/1980 is different from the on-site situation;
- in the train running direction, after the derailment site, one identified concrete sleepers whose obliquity against the laying plan was exceeding 10 cm. It led in some cases to the sleeper

distraction, especially at the blockets. The sleeper obliquity against the laying plan was found especially at the welding points and it is determined by axial forces of different values that appear in the welded rails and because that sleepers was not moved so between the edge of the metal plate and the burrs resulting from the welding of the rail to be an area of more than 10 cm.

Concerning the joint composition

- the composition of the joints close to the derailment site does not comply with the technical conditions for the building of the ensemble „joint”, because of:
 - the position of the sleepers at the joints did not meet with the sleeper laying for the joints made of rail type 49 and indirect fastening type K;
 - in the expention joints one introduces small pieces of rail in order to reduce the breather joint;
 - the fish plates were not fastened ythrough 4 horizontal screws;
 - a part of the vertical rail clips type K was missing.

Safety recommendations

The derailment of the wagons, from the composition of the freight train no.23652, happened because the unsuitable maintenance of the railway infrastructure, corroborated with the over-loading of the train wagons.

During the investigation, the investigation commission found out that:

- the management of the infrastructure manager, at central and regional level, did not meet with the practice codes with reference to the superstructure maintenance;
- the consignor of wagons of the involved train did not meet with the provisions from the Annex II RIV concerning the maximum load on axle and the loading limits for the wagons.

As it os stipulated in the chapter *C.5.2. Safety management system*, the investigation commission considers that :

- non-compliance with the provisions from 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 relevant requirements within the whole life cycle of the lines in the maintenance process”, part of the safety management system of CNCF “CFR” SA, led to the unsuitable maintenance of the track superstructure at the derailment site;
- non-application o of all provisions from the operational procedure code PO 431-SMS „Identification and assessment of the risks associated to the railway safety” Edition 1, Revision 00 from 2011, part of the safety management system of SNTFM „CFR Marfă” SA, concerning the identification and assessment of the risks induced by the over-taking/handing over of the wagon consignments from/to the consignor, performed in the sub-units of the railway county Banat-Oltenia led to the over-taking for transports of some wagons that were not loaded according to the provisions from points 3.1 and 3.2 from the Annex II RIV, concerning the maximum load on axle and the loading limits.

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

3.4.12 The incident happened on the 19th March 2016, in the railway county Craiova, on the industrial branch got by Terminal Arpechim, connected at the railway station Bradu de Sus, consisted in the derailment of the two first wagons after the locomotive, owned by the economic agent CH-VTGCH and rented by SNTFM CFR Marfă SA.

The investigation report was concluded on the 3rd April 2017.

Direct cause:

Direct cause of the railway incident was the passing of the shunting signal M4 on stop position, followed by the operation of the derailer S2, after passing the locomotive of the rake of wagons CM3.

Contributing factors:

- the driver did not meet with the position of the signal M4, which position was prohibiting its passing in stop position;
- failure of the equipment CED for a long time, it leading to the change of the working way in one unsuitable for the railway system.

Underlying causes:

None.

Root causes:

None.

Additional remarks:

- one did not comply with the sheet no.10 from the Operation technical Plan, in RRLISC not being stipulated the hour when the external station movements inspector went on site for the control of the occupied track sections, only the hour of his coming back;
- the operation non in accordance with the provisions of the Government Decison 117/2010, Regulations for investigation, of the switch 2/S2 by the movement staff after the incident occurrence.

Safety recommendations:

None.

3.4.13 The railway incident happened on the 5th May 2015, at 23:00 o'clock, in the railway county Craiova, in the railway station Caracal, consisted in the hit of the motor from the switch no.30, by the train no.39552, hauled by DA 1009 (got by the railway undertaking Deutsche Bahn Cargo România SRL).

The investigation report was concluded on the 27th April 2017.

Direct cause:

The direct cause of the railway incident was the entrance into the structure clearance of the coil box from the equipment for the automatic control of speed type INDUSSI of the locomotive, following its detachment from the locomotive body, where it was temporarily ensured, following a railway accident.

Contributing factors:

The factor contributing to the incident occurrence was the occurrence of a railway accident, consisting in the hit by the train locomotive of a road vehicle on the level crossing from km.222+900, between the railway stations Ionești and Arcești.

Underlying causes:

None.

Root causes:

Lack of regulations(procedures) for the intervention of the locomotive crew in case of appearance of damages at the rolling stock, in situations of road vehicle hits within running line or in railway stations, for the running continuation.

Measures:

Following this railway incident, the locomotive was stopped in the railway station Caracal for the damage repair.

Safety recommendations:

In case of the incident happened in the running of the freight train no.39552, that at its stabling in the railway station on the line 7, the cover of the motor from the switch no.30 was hit by the inductor of the hauling diesel locomotive DA 92 53 0 651009-8.

The hit of the cover from the motor of the switch no.30 by the inductor casing could not have happened if there were drafted clear procedures for the intervention of the locomotive crew in case of damages at the rolling stock appeared following accidents occurred within running line or in railway stations.

Following these above mentioned, the investigation commission considers necessary to issue the next safety recommendation, according which Romanian Railway Safety Authority ask SC Deutsche Bahn Cargo România SRL, that, as railway undertaking, within its safety management system, introduce a procedure for the intervention of the locomotive crew, that include the safety measures that have to be implemented in order to be sure that, within this process the national safety norms are met in case of such accidents.

3.4.14 The railway accident happened on the 8th of May 2016, at about 22:48 o'clock, in the railway county Brasov, track section Braşov - Ploieşti Vest (electrified double-track line), between the railway stations Predeal and Timișu de Sus, km 148+125, on the track I, in the running of the freight train no.33304 (got by the railway undertaking SNTFM „CFR Marfă” SA), consisted in a fire burst into the hauling locomotive EA 852.

The investigation report was concluded on the 3rd May 2017.

Direct cause:

Direct cause of the accident is the over-heating of the traction engine no.4 and of the oil deposits resulted from the bad operation of the air compressors, that under the action of the air stream from the tunnel where the locomotive was stopped, led finally to the ignition of the power supply cables of the engine

Contributing factors:

- overload of the traction engines at high values and variations of the current intensity, for a long time, in the conditions in which the freight train no. 33304 was hauled, on the 8th of May 2016 (heavy rain, track on rising gradient with the medium grade of 24,43‰, decreasing of the hauling capacity of the banking locomotive because its sliding tendency and the activation of the anti-sliding device);
- out of service of the devices, of the hauling locomotives, for the sanding of the lines;
- unsuitable maintenance of the locomotive, consisting in the non removal of the oil leakages from the air compressors;
- keeping in operation of the locomotive EA no.40-0852-0 that from technical point of view did not meet with the safety conditions, comfort and security of the traffic, after exceeding the time and km norms imposed for the performance of the planned repairs and inspections.

Underlying causes:

- infringement of the provisions from the Instruction for the activity of the locomotive staff no.201/2007, art.40, letter h, that forbids „*the exit of the locomotives from the engine sheds for the hauling of the trains or for shunting, with the next pices, devices and equipmenmts missing or out of service: ... sanding device of the line*”;
- infringement of the provisions from the Technical Specifications ST-LE 5100 kW-Rev.-Planned inspections type PTAE (PTh), RAC, RI, RT, R1, R2 and accidental repairs type RIT, RIR, RAD, RA at electric locomotives of 5100 kW in 2015, that stipulates at points 95, „*fixing the faults of the oil and air leakages*” within the planned inspections type RT, R1, R2;
- infringement of the provisions of Railway Norm "Railway vehicles. Types of planned inspections and repairs. Norms of time and km run for the performance of planned inspections and repairs approved through the Order of Minister of Transports and Infrastructure no.315/2011, amended through the Order of Minister of Transports and Infrastructure no.1359/2012, point.3.1, for the withdrawal of the locomotive from operation for the performance of the planned repairs;
- infringement 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 or km run for the performance of planned inspections and repairs", approved through Order of Minister of Transports and Infrastructure no.315/2011, amended through the Order of Minsiter of Transports and Infrastructure no.1359/2012, tabel no.3.1.

Root cause

The root cause of the accident was the unsuitable drawing up of the operational procedure „Maintenance and repair of the traction rolling stock” code PO 74.3, made in 2011, that does not stipulate the withdrawal of the locomotives from operation for the performance of the planned repairs, only their performance according to the allocated funds. So, this procedure does not meet with the Railway Norm "Railway vehicles. Types of planned inspections and repairs. Norms of time and km run for the performance of planned inspections and repairs", approved through the Order of Minister of Transports and Infrastructure no.315/2011, amended through the Order of Minister of Transports and Infrastructure no.1359/2012.

Additional remarks:

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

- the on-board notebook existing in the locomotive, when the accident happened, had not the pages numbered, was not tied and sealed in accordance with the provisions of Order DTV no.17/RLH/2372/1981;
- in the route sheet one did not mention those two stops between the railway station Dârste and the last one when the accident happened, against the provisions from Instructions for the activity of locomotive crew no.201/2007, Annex no.1, Art.19 (1), letterd).
- Infringement of the provisions from Instructions for the activity of the locomotive crew no.201, Art.34 (3) and Art.2(1) letter d) from Annex no.4, for „written information of the staff responsible for solving”, of „problems appeared in operation”, besides „writing down in the on-board notebook”, respectively „ask the specialized technical staff to remove the technical problems appeared along the route or during the intermediary inspection...” by all staff (drivers and locomotive inspectors) which performed services or inspected the locomotive between September 2015 and the accident occurrence;
- The forms for the locomotive inspection used by those two locomotive inspectors from the Engine Shed Braşov which performed technical inspections for the locomotive stabling/ putting in service in/from the depot, are different from each other, although they should show the same, and none of them complies with the operational procedure code F-PO-5-7.5.1-13-01 of the railway undertaking SNTFC „CFR Călători” SA.

Safety recommendations

During the investigation one found out that the locomotive involved in the accident was not suitable from technical point of view in order to ensure the safety conditions, comfort and security of the traffic, having norms of time and km for the performance both of the planned repairs and planned inspections exceeded, against the provisions of the Order of Minister of Transports and Infrastructure no.1359/2012 for the amendment of the Railway Norm "Railway vehicles. Types of planned inspections and repairs. Norms of time and km run for the performance of planned inspections and repairs", approved through the Order of Minister of Transports and Infrastructure no. 315/2011, it being a factor contributing the accident occurrence.

The locomotive had also out of service the device for the track sanding, this failure was forbidding its exit from the engine shed, according to the practice code „Instructions for the activity of the locomotive staff” no.201/2007, art.40, it being a factor contributing the accident occurrence.

With reference to the technical condition of the locomotive, the railway freight undertaking could not provide the report of the technical assessment, that is basis for the granting of the safety certificate for this locomotive, against the provisions of the Order of the Minister of Transports no.535/2007.

In this respect, the investigation commission considers that for the renewal of the safety certificate part B, no. RO1220150100, got by the railway freight undertaking, ASFR did not entirely comply with the provisions of the order above mentioned, that is art.19(3), art.15(4), point 12 of the Annex 2 – NORMS for the granting of the safety certificates.

Taking into account that these findings are deviations from the regulations in force as well as that the surveillance of the economic operators from the railway field and the granting of the safety certificates are the responsibility of Romanian Railway Safety Authority – ASFR, the investigation commission

does not consider necessary to issue safety recommendations, but it proposes to be paid an increase attention to the fulfillment of these duties.

1. During the investigation, concerning the safety management system of the railway freight undertaking, one found out deficiencies in the drawing up of some procedures and instructions as they are mentioned in the chapter C.5.2. Safety management system of this report, therefore the investigation commission recommends Romanian Railway Safety Authority – ASFR to ask railway freight undertaking the revision of the safety management system, drawing up procedures or instructions in accordance with the national and European norms in force for the control of the risks associated to the railway operations and their meeting.
2. Analyzing the submitted documents, the investigation commission found that the locomotive staff is trained theoretically and from the provisions of the Guide for the prevention of the fires in the locomotives, approved through the Order 17 RL/1/1988, concerning the performance of the inspections at the locomotives, number of extinguishers necessary in the locomotive and the classification of the fires at the multiple units.

According to the paper of the General Department of Regulations and Quality of the Railway Services within the Minister of Public Works, Transports and Lodgings, sent also to „SNTFM „CFR Marfă” SA, Order 17 RL/1/1988 was cancelled.

Taking into account this issue, the investigation commission recommends Romanian Railway Safety Authority – ASFR that, in accordance with its duties from the Law for the railway safety, respectively „monitoring, promoting and, if case, application and development of the safety regulation framework, including the safety national norms”, to proceed to the updating of the regulation framework concerning the prevention of the fires in the locomotive.

3.4.15 The railway accident happened on the 21st May 2016, at 06:10 o'clock, in the railway county Craiova, track section Turceni – Drăgotești (electrified single-track line), in the railway station Drăgotești, at the crossing of the freight train no.23639 over the switch no. 7 (got by railway undertaking SNTFM „CFR Marfă” SA), consisted in the derailment of the second bogie of the wagon no.81536654400-6, the 27th one, in the running direction.

The investigation report was concluded on the 19th April 2017.

Direct cause:

The direct cause of the accident is the operation of the switches 7/11, for access on the line 3, at the passing of the freight train no.23639 on the entry section to the direct line II.

Underlying cause

- infringement of the art.19 of the Regulations for the use of interlocking equipments from the railway station Dragotești, that is at the use of the calling-on signal, the movements inspector has to monitor the equipment C.E.D., not operate any switch of the route or derailing one, up to the stabling of the train on the line.
- infringement of the sheet no.11 of the Technical Operation Plan, that is the movements inspector did not go on site or did not receive confirmation from the pointsman.

Root cause

None.

Additional remarks:

Following the existence for a long time (16 years) of insulated track sections within the railway station Drăgotești, declared out of order, the way to operate the interlocking system by the movements inspectors, was changed against the designed one, these did not seal anymore the command device.

Safety recommendations

None.

3.4.16 The railway accident happened on the 25th May 2016, at 16,45 o'clock, in the railway county Timisoara, track section Simeria – Hunedoara (electrified single-track line), in the railway station Pestiș in the running of the freight train no.30638 (got by the railway freight

undertaking SC Deutsche Bahn Cargo România SRL), consisted in the derailment of 11 wagons.

The investigation report was concluded on the 23rd May 2017.

Direct cause

The direct cause of the accident was the unsuitable condition of the track at the derailment site, line IV from the railway station Pestiș, that under the action of the dynamic forces of the rolling stock led to the exceeding of the accepted operation tolerances.

Contributing factors:

- unsuitable technical condition of the normal wooden sleepers that, under the dynamic forces sent by the rolling stock to the fastening elements of the metallic plates, could not keep between the tolerances the gauge value;
- chocking of the track bed and differences of level at the derailment site, in the point „0” the outside rail level (hef = 15 mm) being under the level of the inside rail (hseized = - 5 mm), at measurements made in static mode;
- exceeding of the maximum running speed stipulated in the operation technical plan (PTE) of the railway station Pestiș;
- non-supplying of the Line District no.2 Simeria, with normal wooden sleepers (railway critical products from the risk class IA), necessary according to the last count of the unsuitable sleepers;
- non-ensuring of the necessary workers for the performance of the railway infrastructure maintenance in the Line District no.2 Simeria, district that ensured the performance of these works in the railway station Pestiș;

Underlying causes:

- infringement of the provisions of the art.25, paragraphs (2) and (4) from „Instruction of norms and tolerances for the track construction and maintenance - track with standard gauge no.314/1989”, concerning the failures that impose the replacement of the wooden sleepers and non-keeping within the track of unsuitable sleepers;
- infringement of the provisions of point 4.1 from the 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 hand maintenance;
- infringement of the provisions from the art.166, paragraph (3), from the Regulations for the Railway Technical Operation no.002 approved through the Order of the Minister of Public Works, Transports and Lodgings no.1186 from the 29th of August 2001, according which the provisions from the operation technical plan of the railway station are compulsory for the staff with responsibilities in the traffic safety at to the railway undertaking that perform transports in the respective railway station.

Root causes:

- non-application of all 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 maintenance process”, part of the safety management system of CNCF „CFR” SA, concerning the ensuring the materials and manpower necessary for the performance of the current maintenance and periodic repair to keep the safety level at the accident site.
- disparity between the provisions from the operation technical plan of the railway station (PTE) and the Sheet for the Notification of the Speed Restrictions (BAR) Timișoara, for the period of time the 11th and the 31st 2016, line 214, concerning the maximum running speed at the accident site.

Additional remarks

- during the accident investigation, the investigation commission found out some noncompliances, without cause connection with the accident occurrence:
- line IV of the railway station Pestiș, at the derailment site, had the superstructure without joints (curve with radius of 300 m / rail type 49 / wooden sleepers), the technical and

constructive conditions for the non-welded track not being met, stipulated in the Instruction for the composition, maintenance and monitoring of the non-welded track no.341/1980, art.16, point 3, letter a, that stipulates that it can be „straight line and curves with the minimum radius of 500 m, on vertical alignment tracks and tracks with slopes under 20‰. In curves with smaller radius and slopes higher, it shall be done in special cases, with the approval of the Line Direction”.

Measures taken

The sheet for the notification of the speed restrictions (BAR) Timișoara, for the line 214, was aligned at the provisions of the operation technical plan (PTE) of the railway station Pestiș, concerning the maximum running speed.

Safety recommendations

As it is stipulated at Chapter C.5.2. Safety management System, the investigation commission considers that the 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 cycle of the lines in the process of maintenance”, part of the safety management system of CNCF „CFR” SA, led to an unsuitable maintenance of the track superstructure at the derailment site.

So, if the public railway infrastructure administrator had applied its own procedures of the safety management system, completely, as well as the provisions of the practice codes, part of SMS, he could keep the technical parameters of the track geometry between the tolerances imposed by the railway safety and prevent the occurrence of this accident.

Taking into account the presented issues, as well as that the factors contributing to the accident occurrence are based on the deviations from the practice codes, the compliance with them being completely in charge of the infrastructure administrator (as it is stipulated also in the Regulations EU no.1078/2012), the investigation commission does not consider necessary to issue some safety recommendations.

3.4.17 The railway accident happened on the 28th May 2016, at 16:55 o'clock, in the railway county Craiova, track section Băbeni - Alunu (non-electrified single-track line), between the railway stations Alunu and Berbești, km 37+805, in the running of the freight train no.79184 (got by the railway freight undertaking SC Grup Feroviar Român SA), consisted in the derailment of the second bogie of the 15th wagon, in the running direction .

The investigation report was concluded on the 23rd May 2017.

Direct cause :

Direct cause of the railway accident is the fall of the left wheel (wheel no. 6) of the leading axle from the second bogie of the wagon no. 31536634061-2, the 15th of the freight train no. 79184, between the rails, because the line technical condition, that under the action of the dynamic forces transmitted by the rolling stock in movement, allowed the exceeding of the operation tolerances of the geometric parameters of the line.

Contributing factors:

- unsuitable technical condition of the wooden sleepers at the point „0” (point where the wheel no. 6 fell inside the track), that did not ensure the fastening of the rails and the keeping of the gauge between the accepted tolerances;
- lack of supplying with normal wooden sleepers at the Line District no.7 Popești, necessary for the maintenance and repair of the line;
- under-sizing on the workers from the Line District no.7 Popești, in charge with the maintenance of the railway infrastructure at the accident site.

Underlying causes:

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

- infringement of the provisions of point 4.1 from the Chapter 4 „Norms of manpower and material consumption”, of „Instruction for the line maintenance no.300/1982” concerning the ensuring with the norm of manpower for the current hand maintenance;
- non-complying with the overhaul cycle for the railway infrastructure, against the provisions from art.11(1) of " Instructions for overhaul of the railway lines no.303/2003".

Root causes:

Root cause of the accident is the non-application of the provisions from the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards și requirements relevant for the whole life cycle of the lines in maintenance process”, part of the safety management system of CNCF „CFR” SA, concerning the sizing of the staff from the sub-units for the line maintenance, reporting to the works, through the under-sizing the staff of the Line District no.7 Popești from the Track Section L3 Râmnicu Vâlcea.

Additional remarks

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

- in the station for the forming of the freight train no.79184, involved in this railway event, the technical inspection in the forming process was not performed, infringing in a such way the provisions of art.6 from Instructions for the technical inspection and maintenance of wagons in operation no.250/2005. We underline that, the conditions for the performance of the technical inspection at the train wagons are not met, in accordance with the provisions of art.74, point 4 from Instructions for the technical inspection and maintenance of wagons in operation no.250/2005, because:
 - the train wagons ran repeatedly as a block train between those two railway stations, (as it results from the documents submitted by the railway undertaking SC Grup Feroviar Român SA, those ran in the month before that railway event between the railway stations: Alunu - Berbești - Băbeni);
 - the railway stations, where the wagons ran, are not provided with examiners (the railway undertaking SC Grup Feroviar Român SA having organized the activity of that type of railway staff in the railway station Băbeni).
- during the quarterly analysis of traffic safety made at Track Section level, railway county Craiova, has not appointed a representative with decision powers, who be informed and solve the traffic safety problem appeared in the territory subunits. Even more, the minutes concluded following those analysis are not submitted to the management of the railway county Craiova;
- the schedule for measurements at the line of the testing and recording car (VMC) is inefficiently made, lines with real superstructure problems being sometimes scheduled once per year for measurements. Complementary measurements with the track gauge or with the measurement trolley are not many times so effective as those performed with the testing and recording car (VMC), in the context of the dynamic load transmitted by it on the track superstructure during the measurements;
- the finding notes drafted following the hierarchical controls in the Line Districts L do not achieve the purpose, the measures established following these controls are most often impossible to implement in the subunits. Also, the notes drafted are not submitted to the management of the railway county Craiova.

Safety recommendations

As it is stipulated at Chapter C.5.2. Safety management System, the investigation commission considers that the 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 cycle of the lines in the process of maintenance”, part of the safety management system of CNCF „CFR” SA, led to an unsuitable maintenance of the track superstructure at the derailment site.

So, if the public railway infrastructure administrator had applied its own procedures of the safety management system, completely, as well as the provisions of the practice codes, part of SMS, he a

could keep the technical parameters of the track geometry between the tolerances imposed by the railway safety and prevent the occurrence of this accident.

Taking into account the presented issues, as well as that the factors contributing to the accident occurrence are based on the deviations from the practice codes, the compliance with them being completely in charge of the infrastructure administrator (as it is stipulated also in the Regulations EU no.1078/2012), the investigation commission does not consider necessary to issue some safety recommendations.

3.4.18 The railway incident happened on the 1st June 2016, at 01:30 o'clock, in the railway county Iași, between the railway stations Ruginoasa and Pașcani, consisted in the hit of 9 track inductors by the locomotive EC-085 of the passenger train no.5402-1, got by the railway undertaking SNTFC „CFR Călători” SA.

The investigation report was concluded on the 30th May 2017.

Direct cause:

The direct cause of the railway incident was the exceeding of the gauge limit for the elements of the railway equipments, by the traction shackle, following its detachment from the end for fastening on the bogie bolster, hitting the very close equipments.

Contributing factors:

Unsuitable maintenance of the locomotive EC 085 because:

- non-performance of the planned repair, type RG, with deadline the 20th December 2009;
- use of structural parts (bolts, nuts) made of materials with inconsistent technical characteristics, made in other constructive versions than those prescribed (bolt without lubrications channel, nut without groove);
- lack of regulation in the Technical Specification for the compulsoriness to lubricate the sliding bearing between the bolt and the shackle bushing, at any type of planned inspection. We underline that the existence of a such norm should lead to the proper adoption of the constructive solutions of bolts and nuts (during the preventive maintenance one should have been identified bolts without lubrication channels and the situation was removed). So, the unit bolt – nut, for the support of the traction shackles, was not submitted only to the corrective maintenance (they were fastened when they where found loosened), not to those of preventive maintenance (there is no regulation in this respect, through the Technical Specification approved by AFER);
- lack of an unsuitable training (adequate) for the staff with responsibilities in the technical checking, in the sense of those presented, concerning these constructive details of the mechanical part of the electric locomotive type Bo-Bo de 3400 KW.

Underlying causes:

- infringement of the provisions from subpoint 3.1 of the Railway Norm N.F. 67/006:2011 "Railway vehicles. Types of planned inspections and repairs. Norms of time or km run for the performance of planned inspections and repairs", aproved through Order of the Minister of Transports and Infrastructure no.315/2011, amended through the Order no.1359/2012 of the Minister of Transports and Infrastructure, that is the locomotive EC 085 was not withdrawn when it reached the time norm;
- infringement of the provisions from Instructions for the activity of the locomotive crew no.201/2007, Annex 4 – Obligations of the locomotive inspector for the locomotive technical condition - art.2, paragraph (1) letter c), paragraph (5), art.3, paragraph (1) letters c) and f) concerning the obligations of the staff with responsibilities in checking and attesting the locomotive technical condition at their entry and exit from the traction units for the train hauling.

Root causes:

None.

Safety recommendations:

None.

3.4.19 The railway accident happened on the 14th June 2016, at about 16:45 o'clock, in the railway county Brasov, track section Braşov - Sighişoara (electrified double-track line), between the railway stations Caţa and Rupea, consisted in a fire burst into the locomotive EA 557, being a dead one in the passenger train Regio no.3536, got by the railway undertaking SNTFC „CFR Călători” SA.

The investigation report was concluded on the 25th May 2017.

Direct cause

The fire happened because the mechanical interaction between the windings of the rotor and of those of the stator, because the detachment of the band from the rotor winding, leading to a serious local heating and appearance of sparks, it generating the ignition of the electrical insulation of the power supply cables from the traction engine no.4, of the duct hose of the ventilation and the fire propagation at the other components.

Contributing factors

- deterioration of the band of the rotor winding because its aging;
- keeping in service of the locomotive EA 557, after reaching the norms of time/km for the performance of the planned repairs.

Underlying causes

Infringement of the provisions of the Railway Norm 67-006:2011 "Railway vehicles. Types of revisions and planned repairs. Norms of time and run km for the performance of the inspections and planned repairs", approved through the Order of the Minister of Transports and Infrastructure no.315/2011, amended through the Order of Minister of Transports and Infrastructure no.1359/2012, respectively:

- chapter 3 – Norms for the performance of inspections and planned repairs of the railway vehicles and their periodicity, sub-point 3.1, that is the locomotive EA 557 was not withdrawn from running when it reached the norm of time or km stipulated for the performance of the planned repairs;
- chapter 3 – Norms for the performance of the inspections and planned repairs of the railway vehicles and their cycle, Table 3.1, letter A, position no.1, that is the cycle of the planned repairs for the locomotive EA 557 was not met.

Root causes

- infringement of the requirements from the operational procedure PO-07.1-14 “Planning of inspections and repairs for locomotives, multiple units and electrical multiple units got by SNTFC “CFR Călători” SA” chapter 4.7 - Organization of the planning of the scheduled repairs, point 4.7.5 – Sequence and periodicity of the inspections and scheduled repairs - Annex no. 1 code F-PO-7.1-14-01 – point A.1 concerning the Norm of time or km run for the performance of the planned repairs;
- lack of some real provisions for keeping under control of the risks generated by the danger represented by “Non-meeting with the cycle of inspections and repairs at the rolling stock”.

Measures taken

Following this accident, the railway passenger undertaking SNTFC „CFR Călători” SA disposed the next measures:

- control carefully the traction electromotors during the planned inspections;
- planning of the locomotives for repairs type RR, RG and RK, according to their age and allocated budget;
- through the plan of measures no. RSC/12/647/25.07.2016, drawn up by the General Safety Traffic Inspectorate, one disposed the checking of the way to make the inspections of multiple units, as well as their reception, during the controls scheduled in the sub-units T;
- through the paper no.BV12/1/1051/05.10.2016, drawn up by the Regional Safety Traffic Inspectorate Braşov, the specialists from the Railway County Brasov is alerted on the

compliance with the types of inspections and repairs at the locomotives, with the stipulated norms of time and km, as well with the compulsory operations that have to be performed.

Safety recommendations

About the accident happened on the 14th of June 2016, in the running of the passenger train Regio no.3536, one found out that the fire burst into the locomotive EA 557 was because the failure of the traction engine no.4, whose technical condition had to be kept under control for inspections and specific works of maintenance, performed during the planned repairs.

During the investigation, one found out that the locomotive EA 557 was kept in service after reaching the norms of time and km for the performance of the planned repairs, infringing the provisions of the Order of Minister of Transports and Infrastructure MTI no.1359/2012 for the amendment of the Railway Norm "Railway vehicles. Types of inspections and planned repairs. Norms of time and run km for the performance of the inspections and planned repairs", approved through the Order of the Minister of Transports and Infrastructure no.315/2011, it being a factor that contributed to the accident occurrence.

Taking into account that this factor was generated by deviations from the regulations in force, as well as that the oversight of the economic operators from the railway field is in charge of Romanian Railway Safety Authority – ASFR, the investigation commission does not consider necessary to issue some safety recommendations.

- Concerning the safety management system of the railway passenger undertaking, one found out some deficiencies in the drawing up and application of some procedures, as they are pointed out in chapter C.5.2. Safety management system from this report, therefore the investigation commission recommends Romanian Railway Safety Authority – ASFR to ask railway passenger undertaking SNTFC „CFR Călători” SA the revision of the operational procedures „Management of the risks associated to the railway safety” and „Planning of the inspections and repairs at the locomotives, multiple units and electrical multiple units got by SNTFC „CFR Călători””, so these ensure the identification of risks associated to the railway safety, as well as that the maintenance and operation of the locomotives are made in accordance with the specific legislation.

3.4.20 The railway accident happened on the 22nd June 2016, at 17:48 o'clock , in the railway county Cluj, track section Salva – Vișeu de Jos (non-electrified single-track line), between the railway stations Telciu and Coșbuc, km 12+200, in the running of the freight train no.42564, got by the railway undertaking SNTFM „CFR Marfă” SA, consisted in the derailment of two wagons.

The investigation report was concluded on the 14th June 2017.

Direct cause:

The direct cause of this railway accident is the loss of the horizontal stability of the group rail-sleepers under the action of the dynamic forces transmitted by the rolling stock during the train running, it leading to the overclimbing of the gauge face of the rail, corresponding to the outside rail of the curve, by the flange of the wheel no.5 from the right side of the first axle from the second bogie, in the running direction, of the wagon no.31535301647-2 (the 31st one of the train), followed by the fall of the left wheel of the same axle between the rails.

Contributing factors:

- high values of the temperature registered in the rails, taking into account that : the derailment happened in an area with mixed cross section, it leading to the keeping of high temperatures registered in the air and in the rails;
- when the derailment happened, the temperature registered in rails was between 460C-480C (when the derailment happened it was of about 460C);
- the non-welded track at the derailment site was not formed in accordance with the instructions, that is the joints were not "on square" because for the track construction at the derailment site one used rails of different lengths, and the number of joints from the outside rail of the curve

was different from the number of joints from the inside rail of the curve (on the outside rail of the curve there were 6 joints and on the inside one there were 4 joints);

- the sizes of the expansion joints, whose values in operation were under the values of the joints accepted in operation;
- the shape of the broken stone track bed, that did not comply with the geometry of the broken stone track bed for the current line, route in curve, non-welded track fitted on wooden sleepers;
- existence at the derailment site of some track sections with insufficient broken stone;

Underlying causes

- infringement of the provisions of art.10, point B.2 from „Instruction of norms and tolerances for the track construction and maintenance”- no.314/1989, concerning the expansion joints, that have to be from size point of view as uniform as possible;
- infringement of the provisions from the point 4 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.
- infringement of the provisions of art.14.2 from „Instruction of norms and tolerances for the track construction and maintenance” - no.314/1989 concerning the shape of the broken stone track bed and its sizes.

Root causes

- non-application of the provisions from the Instruction for the track 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 lifetime 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 sub-units for the line maintenance, in relation to the work quantity;
- non-identification of the dangers generated by the insufficient supply with some materials necessary in the maintenance process, in order to make track panel from normal wooden sleepers and rails.

Safety recommendations

The derailment of those two wagons of the freight train no.42564 happened because the unsuitable maintenance of the railway infrastructure.

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

Taking into account the factors contributing at the accident occurrence, factors based on the 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 to issue some safety recommendations.

3.4.21 The railway accident happened on the 10th July 2016, at 11:40 o'clock, in the railway county București, in the railway station Bucureștii Noi, in the running of the freight train no.71706, got by the railway freight undertaking SNTFM „CFR Marfă” SA, consisted in the derailment of one bogie from the 12th and 13th wagons of the train.

The investigation report was concluded on the 16th June 2017.

Direct cause

The direct cause of the accident is the overclimbing of the active shoulder of the head of the rail from the exterior rail of the curve by the flange of the leading wheel from the second bogie (wheel no.6 on the left side in the running direction) from the wagon no.3153933525-2, following the increase of the ratio between the guiding force and the load on the wheel, so exceeding the stability limit at derailment.

The increase of the ratio between the guiding force and load on the wheel happened because the load transfer of this wheel and the increase of the lateral force (guiding one) on this wheel.

Contributing factors

affherent to the track superstructure:

- difference of 12 mm between the values of the cross section of the track, statically measured, between the points „0” and „4” situated at 10 m, distance approximately equal with the wheel base of the wagon no.31539335525-2, that derailed;
- chocking of the broken stone track bed at the derailment site, that led to vertical movements of the frame rail-sleeper under the dynamic effect of the rolling stock passing;
- superelevation of the track existing at the derailment site;
- areas with insufficient compacting through packing of sleepers in order to keep the cross section of the track.

All these factors led to the partial transfer of the vertical load that acted on the leading wheel of the guiding axle from the second bogie of the wagon no.31539335525-2.

affherent to the rolling stock:

- total destruction of the polyamide plates situated between the centre castings of the wagon no.31539335525-2. It led to the appearance of a direct friction between the lower centre castings and the upper ones and implicitly to the increase of the friction moment between these parts those two parts of the centre casting assembly, affecting the mobility of those two bogies and leading to the decrease of vehicle capability to negotiate the curve, respectively the increase of the lateral force (guiding one).

Underlying causes:

- infringement of the provisions of art.25, points (2), (3) and (4) from „Instruction of norms and tolerances for the construction and maintenance of the lines with standard gauge no.314/1989”, concerning the failures that impose the replacement of the wooden and concrete sleepers;
- non-meeting with the cycles of overhauls of the railway infrastructure, against the provisions art.11(1) from " Instructions for overhauls of the lines no.303/2003";
- infringement of the provisions art.87, table 6 – „failures and wears at the chassis and bogies” from Instructions for the technical inspection and maintenance of the operated wagons no.250/2005 for the withdrawal from traffic of the wagons having the value of the total clearance at the side bearers from both sides of the bogie out of established values.

Root cause:

Non-application of all provisions from the operational procedure code PO SMS 0-4.07 „Compliance with technical specifications, standards and relevant requirements for whole life time of the lines in maintenance process” (including the annexes), part of the safety management system of the infrastructure manager CNCF „CFR” SA, concerning:

- coordination of the maintenance and periodic repair of the tracks;
- ensuring of the materials necessary to perform the current maintenance and periodic repair.

Additional remarks

During the investigation, one found out some irregularities irrelevant for the causes of this accident, as follows: the finding notes written down at the hierarchic controls in the Line Districts do not achieve their scope, the measures established following these controls are most often imposible to be implemented at sub-unit level. Also, these notes are not submitted for getting acquainted by the management of the Railway County București.

Safety recommendations:

The derailment of the wagon 31539335525-2, the 12th in the forming of the freight train no.71706, happened because the unsuitable maintenance of the railway infrastructure, corroborated with the failures found at the wagon above mentioned.

During the investigation, the investigation commission found out that:

- the central and regional management of the infrastructure management infringed the provisions of practice codes about the maintenance of the track superstructure;
- the railway freight undertaking SNTFM „CFR Marfă” did not comply with the practice codes for the maintenance in operation of the wagons.

As it is stipulated at the chapter *C.5.2. Safety management system*, the investigation commission considers that:

1. infringement of the provisions from the Instruction for the line maintenance no.300/1982 and from the Instructions for overhauls of the lines no.303/2003, documents associated to the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for whole life time in the maintenance process”, part of the safety management system of CNCF “CFR” SA, led to the unsuitable condition of the track superstructure at the derailment site;
2. non application of all provisions of Instructions for technical inspection and maintenance of wagons in operation no.250/2005, document associated to the procedure code PO 74.4 „Operational Procedure - Wagon Maintenance”, and to the procedure code PO 75.6 „Operational Procedure Activities in the railway stations”, that led to the maintenance in operation of a wagon with failures that impose its withdrawal from traffic.

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

3.4.22 The railway accident happened on the 2nd August 2016, at 06:50 o'clock, in the railway county Craiova, in the railway station Valea Albă, in the running of the freight train no.92310, got by the railway undertaking SNTFM „CFR Marfă” SA, consisted in the derailment of first axle from the locomotive ED 047, the second in front of the train, in the running direction of the train.

The investigation report was concluded on the 28th July 2017.

Direct cause:

The direct cause of the accident was the exceeding of the stability limit at derailment on the leading wheel (right wheel of the first axle from the locomotive ED 047, in the running direction) generated by the transfer of the loading of this wheel and increase of the guiding force.

These led to the overclimbing of the exterior rail of the curve by the leading wheel of the locomotive, followed by the running of the wheel flange on the running surface of the rail about 1,87m and then its fall on the right side of the exterior rail, respectively of the left wheel between the rails.

Contributing factors:

- difference of 6,41 mm between the diameters of the running treads of the wheels from the axle no.6 (the right wheel having a smaller diameter), respectively of 3,51 mm between the diameters of the running treads of the wheels from the axle no.5 (right wheel having a smaller diameter), against tolerance of 1 mm accepted by the specific regulations in force for the axles in operation;
- unsuitable condition of the track geometry at the accident site (exceeding of the tolerances at the track gauge, failures detected by towable measuring wagon, non-fitting of the check rail on the interior rail of the track in curves with big slopes). This situation led to setting, before the accident, of a speed restriction of 15km/h at its site.

Underlying causes

- infringement of the provisions from the annex “DIMENSIONAL CONTROL– Quotes of the components and the wear tolerances for the wheelset from the locomotives and for the axles from the multiple units”, Table 1, point 26.2 from "Instruction for the repair of the wheelset from the railway vehicles no.931/1986” concerning the accepted difference between the diameters of the running treads of the wheels from the same axle (maximum 1 mm in operation).
- infringement of the Instruction of norms and tolerances for the construction and maintenance of lines with standard gauge no. 314/1989, chapter I, art.1 point 14.1, letter c), concerning the accepted tolerances against standard gauge/stipulated for the lines with ballast bed.

Root cause

Non-meeting with all 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” (including the annexes), part of the safety management system of the public railway infrastructure manager CNCF „CFR” SA, with reference to:

- coordination of the maintenance and periodic repairs of the lines;
- ensuring of the materials necessary to perform the current maintenance and the periodic repairs.

Additional remarks

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

- existence of an important number of unsuitable wooden sleepers on the track hectometer 349+700÷800 (72 pieces from a total of 167pieces , representing 43,11%, from which 61pieces to be urgently replaced) resulted following the material from November 2015, against the provisions of chapter IV, art. 25, point 4 from Instruction 314/1989

Safety recommendations

Taking into account the causes and the factors leading to the accident, the investigation commission recommends Romania Railway Safety Authority - ASFR to ensure that both the railway undertaking and the infrastructure manager take the measures necessary for keeping under control the risks generated by the infringement of the provisions for the repairs at the railway vehicles, respectively the track maintenance.

3.4.23 The railway accident happened on the 5th August 2016, at about 17:22 o'clock, in the railway county Galați, track section Buzău – Mărășești (electrified double-track line), between the railway stations Buzău and Boboc, on the track II, km 135+680, in the running of the passenger train no.5110, got by SNTFC „CFR Călători” SA, consisted in a fire burst into the hauling locomotive EA 818

The investigation report was concluded on the 14th July 2017.

Direct cause

The direct cause of the fire was a short-circuit at the cables for the power supply of the traction engine no.3 (when it worked in traction condition), generated by the aluminum from the cooler of the diodes from the rectifier, that melted, because the decrease of the capacity for the heat transfer in the forced convective process and the leaking of the melted material on the terminal block for the fastening of the cables at the entry in the traction engine.

Contributing factors

- unsuitable condition of the surfaces of the aluminum coolers from the rectifier afferent to the traction engine no.3, by their covering with a layer of impurities;
- the unsuitable condition of the surfaces inside the locomotive body, by their covering with a layer of petrol substances resulted from frequent oil leakages of the compressors;
- keeping in operation of the locomotive EA 818, after reaching and exceeding the norms of time/km for the performance of the planned repairs;
- the environment conditions when the fire happened, air temperature was about 32°C and insignificant speed of the wind (hot summer day);
- keeping in operation of the locomotive with the traction engines no.2 and no.4 off.

Underlying causes

Infringement of the provisions of 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 inspections and planned repairs", approved through Order of the Minister of Transports and Infrastructure - OMTI no.315/2011, amended by OMTI no.1359/2012, respectively:

- chapter 3 – Norms for the performance of inspections and planned repairs at the railway vehicles and their periodicity (cycle), sub-point 3.1, that is the locomotive EA 818 was not

withdrawn from running when it reached the norm of time and km stipulated for the performance of the planned repairs;

- chapter 3 – Norms for the performance of the inspections and planned repairs of the railway vehicles and their periodicity (cycle), Table 3.1, letter A, position no.1, that is the cycle of planned repairs for the locomotive EA 818 was not met.

Root causes

Infringement of the requirements stipulated in the operational procedure PO-07.1-14 “*Planning of the inspections and repairs for the locomotives, diesel and electric multiple units got by SNTFC “CFR Călători” SA*” chapter 4.7 – Organization of the planning of the scheduled repairs, point. 4.7.5 – Sequence and periodicity of the inspections and planned repairs - Annex no.1 code F-PO-7.1-14-01 – point A.1 concerning the Norm of time or km run for the performance of the planned repairs.

So, according to the procedure requirements, overhauls had to be performed at the electric locomotive EA 818 in 2007, respectively repairs type RR in 2012.

The operational procedure PO-07.1-14 “*Planning of inspections and repairs for locomotives, motorized trains and multiple units got by SNTFC “CFR Călători” SA*” is not complete, that is it does not contain concrete provisions on the measures that have to be established for the rolling stock that reaches the norm of time/km for the performance of the planned repairs.

Safety recommendations

The railway accident happened on the 5th August 2016, in the running of the passenger train no.5110, fire in the locomotive EA 818 generated by the short-circuit at the cables for the power supply of the traction engine no.3, because the melted aluminum from the coolers of the diodes of the rectifier, happened because the unsuitable condition of the locomotive that had to be controlled through inspections and specific maintenance, performed during the planned repairs.

During the investigation, one found out that the locomotive EA 818 was kept in operation after reaching the norms of time/km for the performance of the planned repairs, contrary the provisions of OMTI no.1359/2012 for the amendment of the Railway Norm "Railway vehicles. Types of inspections and planned repairs. Norms of time or norms of km run for the performance of inspections and planned repairs", approved through the OMTI no. 315/2011, it being a factor contributing the accident occurrence.

Concerning the safety management system

At SNTFC „CFR Călători” SA one found out:

- problems in the implementation of the operational procedure PO-07.1-14 „Planning of the inspections and repairs for the locomotives, diesel and electric multiple units got by SNTFC “CFR Călători” SA”, that is no planned repair RR, RG, according to „Plan for repairs and maintenance” at the locomotive EA 818 was performed;
- problems at the implementation of the „Guide for the prevention of the fires in locomotives” that is the locomotive EA 818 was not equipped with face guards against the smoke and gasses, necessary for intervention in case of fire;
- problems in the draft of „Sheet for the identification of dangers/assessment of generated risks” Code: F-PO-0-8.5.3-05-03, because for the danger „Infringement of the cycle of inspections and repairs of the rolling stock” the general danger was not identified „Fires in the rolling stock”.

Taking into account the causes and the factors contributing the accident occurrence, as well as that the monitoring of the economic operators in the railway field is in charge of Romanian Railway Safety Authority – ASFR, the investigation commission considers necessary to issue the next safety recommendations:

1. during the controls and state inspections, ASFR ensure that the railway undertakings control the risks of fire appearance in the rolling stock, generated by the non-performance of the planned maintenance;
2. ask the railway undertaking SNTFC „CFR Călători” SA to review the Sheet for the identification of dangers/assessment of the generated risks Code: F-PO-0-8.5.3-05-03, so that the danger „Non-meeting with the cycle of inspections and repairs of the rolling stock” the generated risk „Fires in the rolling stock” be identified;

3. ask the railway undertaking SNTFC „CFR Călători” SA to review the operational procedure PO-07.1-14 „Planning of the inspections and repairs for locomotives, diesel and electric multiple-units got by SNTFC “CFR Călători” SA”, so that it be completed with concrete provisions concerning the measures that had to be established if the rolling stock reaches the norm of time/km for the performance of the planned repairs;
4. analyze with the railway undertakings the opportunity to provide the motorized rolling stock with some equipments for the detection of smoke emissions in the critical areas with fire potential;
5. analyze with the railway undertakings the opportunity to replace the joint pipes (exit and suction) of the main transformer tank with the oil cooler, made of inflammable materials with pipes made from non inflammable materials, in order to avoid leakage of a big quantity of oil in the locomotive oil, in case of their deterioration;
6. analyze with the railway undertakings and with the management of the General Inspectorate for Emergency Situations, the intervention way of the firemen in case of fires in the rolling stock so that, for the consequence limitation, not use water as extinguish agent.

3.4.24 The railway accident happened on the 26th August 2016, at 15:45 o'clock, in the railway county București, track section Videle – Giurgiu Nord (non-electrified single-track line), km 54+400, between the railway stations Târnavale and Rădulești, consisted in a fire burst into the locomotive DA 614, running as train no.87232, got by the railway freight undertaking SNTFM „CFR Marfă” SA.

The investigation report was concluded on the 24th July 2017.

Direct cause

The fire happened because the local overheating in the box for the connection of the cables for power supply of the traction engine no.3, because the decrease over time of the di-electric strength between the electric cables with different electric potential, it leading to the ignition of their insulation as well as of the oil rests existing in the area of the fire appearance.

Contributing factors

- oil leakages from the diesel engine, the hydrostatic equipment and the the compressor of the locomotive DA 614, that led to the decrease of the di-electric strength between the electric cables with different electric potential in the box for their connection, corresponding to the electric traction engine no.3;
- keeping in operation of the locomotive DA 614 after reaching the norm of time for the performance of the planned repairs.

Underlying causes

1. infringement of the provisions from Instructions for the activity of the locomotive staff no.201/2006 approved through Order of Minister no.2229/2006, respectively of the art.44-(3) letter,b), concerning the obligation to remove, within the intermediary inspections, the failures at the parts, equipments and assemblies, where the problems appeared during the locomotive operation, written down by the driver in the locomotive incident record;
2. infringement of the provisions Railway Norm 67-006:2011 „Railway vehicles. Types of inspections and planned repairs. Norms of time and km run for the performance of the inspections and planned repairs”, approved through the Order of the Minister of Transports and Infrastructure no.315/2011 with further amendments, respectively:
 - chapter 3 – Norms for the performance of inspections and planned repairs at the railway vehicles and their periodicity (cycle), subsection 3.1, that is the locomotive DA 614 was not withdrawn from traffic at the achievement of the norm of time or km stipulated for the performance of the planned repairs;
 - chapter 3 – Norms for the performance of the inspections and planned repairs at the railway vehicles and their periodicity (cycle), Table 3.1, letter. A, position no.3, that is the cycle of planned repairs at the locomotive DA 614 was not met.

Root causes

- infringement of the provisions from the operational procedure „Identification and assessment of the risks associated to the railway safety” code: PO 431-SMS 1st edition, revision 00, that is the the Zonal Freight Center București did not perform a risk assessment and no measure for their prevention was establish;
- inadequate elaboration of the operational procedure „Maintenance and repairs at the traction rolling stock” code: PO 74.3 2nd edition, revision 00, that is its provisions have no control of the risks generated by the danger generated by “*keeping in operation of the rolling stock after achieving the norm of time/km for the performance of the planned repairs*”.

Measures taken

Following this accident the railway freight undertaking SNTFM „CFR Marfă” SA took the next measures:

- submitted the locomotive DA 614 for repair type RR in the Workshop IRLU Pașcani, this repair shall be finished on the 2nd of March 2017;
- re-discussion with its staff the provisions Disposal no.30 ”Concerning the prevention of the fire beginnings in the diesel-electric locomotives from the engine stock of SNTFM CFR Marfă SA”.

Safety recommendations

In case of the accident happened on the 26th August 2016, in the running of the train no.87232, one found out that the locomotive involved in the accident did not meet the technical requirements that ensure the safety, comfort and security of the traffic, having the norm of time for the performance of the planned repairs exceeded, against the provisions of the Minister of Transports and Infrastructure’s Order no.315/2011, with further amendments.

Keeping in operation of the locomotive DA 614, after reaching the norm of time for the performance of the planned repairs, was possible because the deficiencies in the safety management system, that were the root causes of this accident.

Upon the above mentioned issues, the investigation commission recommends Romanian Railway safety Authority – ASFR to ask the railway freight undertaking SNTFM „CFR Marfă” SA to re-examine the safety management system, so it ensure the identification and control of the risks associated to the railway safety.

3.4.25 The railway accident happened on the 2nd September 2016, at 09:22, in the railway county Craiova, track section Filiași-Strehaia, in the railway station Gura Motrului, in the running of the freight train no.93756-1, got by the railway undertaking SNTFM „CFR Marfă” SA, consisted in the derailment of the first axle of the hauling locomotive EA 130.

The investigation report was concluded on the 31st August 2017.

Causes and contributing factors

The direct cause of the accident was the overclimbing of the exterior rail of the curve by the right wheel of the leading axle no.6 (bogie II) from the locomotive EA 130, in the train running direction, because the exceeding of the derailment stability limit on this wheel, because the increase of the report between the leading force and the load on the leading wheel.

Contributing factors:

- load downloading of the leading wheel from the axle no.6 (first axle in the train running direction), because the less of its counterbalance, the wheels from the axles no.6 and 5, being with the most load transfer compared to the wheel from the axle no.4 from the right side of the first bogie in the running direction;
- unsuitable condition of the track geometry at the accident site (exceeding of the tolerances at cross level and the track twist).

Underlying causes

Infringement of the *Instruction of norms and tolerances for the track construction and maintenance for lines with standard gauge no. 314/1989*, Chapter I, art.7, letter A, points 1 and 4, concerning the

tolerances accepted for the cross level, stipulated for a rail against the another one, respectively the track twist.

Root cause:

Non-application of all provisions from the operation 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” (including the annexes), part of the safety management system got by the public railway infrastructure manager CNCF „CFR” SA, concerning the coordination of the activities for the line maintenance.

Additional remarks:

During the investigation, some deficiencies and lacks were found , without relevance for the conclusions on the accident causes, as follows: existence of a low number of workers in the Line District L1 Butoiești (12 workers from which 3 workes detached or in long time seak-leave against the necessary of 60 workers), against the provisions of the Instruction for lines no.300/1982, point 4.1.

Safety recommendations

Taking into account the causes and the factors leading to the accident, the investigation commission recommends ASFR to take care that both the railway undertaking and the infrastructure manager take the measures needed for the control of the risks generated by the infringement of the provisions for the repairs of the railway vehicles, respectively for the track maintenance.

3.4.26 The railway accident happened on the 2nd October 2016, at 02:45, in the railway county Braşov, track section Braşov - Siculeni (electrified single-track line), between the railway stations Bicsadu Oltului and Malnaş Băi, km 54+100, in the running of the passenger train no.1642, got by the railway undertaking SNTFC „CFR Călători” SA, consisted in the derailment of 6th axle of the hauling locomotive EA 014, in the running direction.

The investigation report was concluded on the 28th September 2017.

Direct cause

The direct cause of the accident was the breakage of axle no.6 from the locomotive EA no.91530400014-3, hauling the train IR no.1642. The breakage of the axle happened because the exceeding of the fatigue limit of the material the axle was made of (the matriculation number in the engine stock: 32978).

Contributing factors:

The high number of the cycles of tension – compression to which the wheelset was submitted during the service time (43 years). So, only from the 1st January 1998 (date starting which the locomotive keeper had records about the route of the wheelset), this wheelset ran 2.002.133 km.

Underlying cause

None.

Root cause

None.

Additional remarks

During the investigation, one found out some deficiencies and gaps, without relevance for the conclusions on the accident causes, as follows:

the composition of the non-welded track was not according the instruction, because:

- at some joints the fastening of the fish plates was made through 3 horizontal screws, instead 4;
- in some cases there were no the type K clips for the fastening of the rail base on the metallic plates;
- some of those 4 wooden sleepers from the joints were unsuitable.

Following the measures taken by the railway public infrastructure manager and the works performed, until the end of November 2016, all wooden sleepers from the joints were replaced with reinforced concrete sleepers type T30. During the period of time 02nd and 03rd May 2017, between km 54+450 and km 55+300, one performed packing of sleepers and mechanical lateral displacement.

Measures taken

After the accident, the railway undertaking issued a paper containing the next measures:

1. Performance of the ultrasonic control (CUS) at the axles of the electric locomotives, compulsory within the planned repairs types RT, R1, R2.
2. Recording, on paper/electronic of the results of ultrasonic controls CUS performed in each depot.

According to the opinion of the investigation commission, these measures can not remove the danger of occurrence of a similar accident, taking into account that:

- last ultrasonic control at the axle broken in this accident was made two weeks before its breakage;
- the period of time for the performance of ultrasonic control before the accident was less than that stipulated in regulations;
- recording of ultrasonic controls is against the point 7 from the Instructions for the ultrasonic control in operation of the wheelset of the electric locomotives of 7350 PH, issued by ICPTT București in 1971, that stipulate „no oscillogram at any axle is recorded, irrespective if it has or doesn't failures - the results of the ultrasonic control are recorded in a register”;
- even under the new conditions, only the results of the control from the axle end with the probe B2S de 13°20' can not be printed, the other controls being continuously made, on the axle body and consequently they can not be printed and recorded.

Safety recommendations

On the 2nd October 2016, between the railway stations Bicsadu Oltului and Malnaș Băi, in the running of the train IR no.1642, the first axle from the hauling locomotive EA no.91530400014-3, in its running direction, derailed, its derailment being generated by the breakage of the wheel axle.

During the accident investigation one found out that the axle with registration number in the engine stock 32978 (involved in the accident) was manufactured in 1973, with 43 years life time. Upon the data supplied by the locomotive keeper, one established that, only starting with the 1st of January 1998, the involved wheelset ran 2.002.133 km.

From the data supplied by the locomotive keeper results that, from the 1st January 1998 until the accident occurrence, the axle was not submitted to ultrasonic control in disassembled condition (with the wheels, gearwheel and roller bearings disassembled), control that could be effective because, under these conditions, the disturbing signals, generated by the parts of the wheelset are reduced.

Taking into account these above mentioned, in order to decrease the risk of axle breakage appearance, the investigation commission issue the next recommendation:

- Romanian Railway Safety Authority, together the railway undertakings, that keep the locomotives like those involved in the accident, shall analyze the opportunity that, at an interval of time or running, at this type of axle be made the ultrasonic control but in disassembled condition.

3.4.27 The railway incident happened on the 2nd October 2016, at 09:40 o'clock, in the railway county Craiova, between the railway stations Hârsești and Recea, consisted in the hit of track inductors by the locomotive DA 1191, got by the railway undertaking SNTFC „CFR Călători” SA, hauling the passenger train Regio no.9401-2.

The investigation report was concluded on the 23rd May 2017.

Direct cause:

The cause of the railway incident was the exit of the lever of the lower support from the vertical shock absorber of the rolling stock gauge and its entry in the structure clearance, following its detachment from the plate for fastening on the bogie frame.

Contributing factors:

- appearance of some cracks at the welded joint between the lever of the lower support of the shock absorber and the plate for its the fastening on the bogie frame during the locomotive operation;

- these cracks could not be identified during the channel inspections, technological process for the locomotive fitting-up, and during the planned inspections, due to the fastening position of the support on the bogie frame.

Underlying causes:

Infringement of the cycle of the compulsory repairs at the locomotive, according to the provisions of the Railway Norm N.F. 67-006:2011 "Railway vehicles. Types of planned inspections and repairs. Norms of time and km run for the performance of planned inspections and repairs", approved through the Order of Minister of Transports and Infrastructure no.315/2011, amended through the Order no.1359/2012 of Minister of Transports and Infrastructure.

Root causes:

None.

Safety recommendations:

In case of the incident happened in the running of the passenger train no.9401-2, hauled by the diesel-electric locomotive DA 1191, one found out that the breakage and the detachment of the lever from the lower support of the shock absorber from the plate for the fastening on the bogie frame happened following the existence of some cracks at the welded area between the support lever and the plate for the fastening during the locomotive operation.

Those cracks between the lever of the lower support of the shock absorber and the plate for fastening on the bogie frame could be identified during the planned repairs, if the norms of time and km of the Railway Norm NF 67-006:2011 "Railway vehicles. Types of planned inspections and repairs. Norms of time and km run for the performance of the planned inspections and repairs" were met.

Upon these above mentioned, the investigation commission considers necessary to issue some safety recommendations, according which Romanian Railway Safety Authority shall ask SNTFC "CFR Călători" SA that, as railway underaking, within the safety managent process, to re-analyze the process for the locomotive maintenance and to establish safety measures that have to be implemented in order to be sure that, within this process, all the national safety norms, including the Railway Norm NF 67-006:2011 "Railway vehicles. Types of planned inspections and repairs. Norms of time and km run for the performance of the planned inspections and repairs" are met.

3.4.28 Railway incident happened on the 6th October 2016, at 09:07 o'clock, in the railway county Craiova, in the railway station Balota, consisted in the hit of a track inductor by the locomotive EA 566, being a dead one within the freight train no. 97559, got by the railway undertaking SNTFM „CFR Marfă” SA.

The investigation report was concluded on the 23rd May 2017.

Direct cause:

The direct cause of the railway incident was the exit of the equipment inductor from the equipment INDUSI from driving post II of the locomotive EA 566, from the rolling stock gauge and its entry in the structure clearance, followed by the hit of the track inductor, afferent to the exit light signal X II from the railway station Balota.

Contributing factors:

- unsuitable fastening of the screw from the threaded case no.2;
- old crack on about 80% from the cross section of the threaded screw area from the threaded case;
- fallen of the screw from the threaded case, fixed in 2 – 3 threads – short screw.

Underlying causes:

None.

Root causes:

None.

Safety recommendations:

With reference to the railway incident happened in the running of the freight train no.97559 consisting in two electric light locomotives (main locomotive ED 007 and multiple one EA 566) one found out that the entry of the inductor from the equipment INDUSI of the locomotive in the rolling stock

structure clearance was generated by the unsuitable fastening of the connecting bar at the ends of the supports of the primary suspension from the axle no.6, left.

It happened following the lack of checking and then the repair of the threaded cases when they are not suitable from the supports of the primary suspension, during the serious repairs type RR and RG, this operation not being mentioned either in the technical specification for repairs type RR and RG at the electric locomotive of 5100 kW code C.S. no.133 – 2013 of SNTFM „CFR Marfă” SA or in the provisions of the technical specification „Planned repairs type RR, RG LE 5100 KW” code ST – LE – RR, RG of the Company for the Locomotive and Vehicle Maintenance and Repairs – CFR IRLU SA.

In the context of these above mentioned, the investigation commission considers necessary to issues the next safety recommendations, according which Romanian Railway Safety Authority shall ask SNTFM „CFR Marfă” SA, together with the Company for the Locomotive and Vehicle Maintenance and Repairs – CFR IRLU SA, to add at the documentation for the inspections and repairs performed at the electric locomotives of 5100 KW clear provisions for the checking and then repairs of the threaded cases, when these do not correspond to the supports of the primary suspension, during the serious repairs type RR și RG.

3.4.29 The railway accident happened on the 19th October 2016, at 22:25 o'clock, in the railway county Constanța, in the railway station Medgidia, in the running of the freight train no.80394, hauled by the locomotive DA 1523 (got by the railway freight undertaking SC GRUP FERROVIAR ROMÂN SA), consisted in the derailment of the first bogie of the 6th wagon, loaded with cement.

The investigation report was concluded on the 9th October 2017.

Direct cause

Direct cause of the accident was the fall between the rails of the left wheel from the guiding axle of the wagon no.3153355119-0, the 6th wagon of the freight train no.80394. It happened because the increase of the track gauge value over the maximum accepted value, following the lateral movement of the exterior rail of the curve under the action of the dynamic forces transmitted to the track by the running rolling stock.

Contributing factors:

Unsuitable technical condition of the wooden sleepers in the point „0”, that under the action of the dynamic forces transmitted by the wheels of the rolling stock, allowed the overwidening of the track, so the gauge exceeded the maximum accepted limit of 1470 mm.

- the unsuitable technical condition of the track was generated by:
- under-sizing of the worker number existing at the Line District no. 1 Medgidia, in charge with the maintenance of the railway infrastructure at the accident site;
- insufficient quantities of wooden sleepers supplied to the Line District no.1 Medgidia for the track maintenance and repair.

Underlying causes

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

Root cause

Root cause of the accident is the nonapplication 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, concerning the sizing of the staff from the sub-units for the line maintenance, in relation to the total works, in case of the Line District L1 Medgidia from the Track Section L2 Medgidia.

Measures taken

After the accident, the management of CNCF „CFR” SA notified the next measures:

- on the 28th October 2016 one established the speed restriction 15km/h on the extension of the line "0B", over the switch no.72 and over the cross-over 72/32;
- in the affected area the wooden sleepers were replaced;
- the track fastenings were replaced and completed in the affected area;
- one performed gauge rectification and rectification of the track level through mechanical packing of sleepers.

Safety recommendations

The derailment of the bogie from the wagon no.31533555119-0, the sixth wagon of the freight train no.80394, happened following the unsuitable maintenance of the railway infrastructure.

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

Taking into account the factors contributing the accident, factors based on underlying causes that are deviations from the practice codes, as well as that the oversight of the economic operators from the railway system is the responsibility of Romanian Railway Safety Authority – ASFR, the investigation commission recommends ASFR to ask economic agents, manufacturing and using wooden impregnated sleepers, to re-assess the control of the risks generated by the impregnation of the wooden sleepers.

3.4.30 The railway incident happened on the 29th October 2016, at 08:58 o'clock, in the railway county Constanța, between the railway stations Dunărea and Cernavodă Pod, consisted in the hit of a metallic element by the locomotive EA 538, hauling the train no.1581, got by the railway undertaking SNTFC „CFR Călători” SA.

The investigation report was concluded on the 23rd February 2017.

Direct cause, contributing factors:

The direct cause of the railway incident was the entry into the structure clearance of „portal operation device”, device operated by the employees of the railway supplier, who were performing repairs at the Danubian bridge at km. 164+900.

Contributing factors:

None.

Underlying causes:

The underlying cause of the railway incident was the non-application of the provisions of the operational procedures:

- PO SMS 0-4.31 concerning the definition and guarantee of the tasks and responsibilities in the railway safety between the contract parties;
- PO SMS 0-4.30 concerning the ensuring of the tracking of documents and contracts with reference to the railway safety;
- PO SMS 0-4.29 concerning the checking and control of the competence, performances and results in the railway safety for the contractors;

part of the Safety Management System of the railway infrastructure manager.

Root causes:

None.

Safety recommendations:

None.

3.4.31 Railway incident happened on the 14th September 2016 and notified through the note from the 9th November 2016 by the General Inspector for Traffic Safety, from the railway county Craiova, in the railway station Caracal, consisted in the exceeding of the speed stipulated at

the speed restriction of 30 km/h from the railway station Caracal, by the train no.20902, got by the railway undertaking SC Trans Feroviar Grup SA, that ran with a speed of 69 km/h.

The investigation report was concluded on the 23rd May 2017.

Direct cause, contributing factors:

The railway incident was generated by human mistake appeared in the driving process of the hauling locomotive of the freight train no.20902, this mistake consisted in the infringement of the disposal of the running order.

Contributing factors:

None.

Underlying causes:

Running with other speeds different from those stipulated in the running order, against the provisions of the Instructions for the activity of the locomotive crew no.201/2007, art.79 paragraph (2) point a and paragraph (4), art.80 paragraph (2), art.125 paragraphs (1) and (3), annex 10 paragraph 14, from the Signalling Regulations no. 004/2006, art.115 paragraphs (1) and (5).

Root causes:

None.

Safety recommendations:

None.

3.4.32 The railway accident happened on the 17th November 2016, at 13:25 o'clock, in the railway county Braşov, track section Gheorgheni - Deda (electrified single-track line), in the railway station Ditrău, in the area of the switch no.4 from the end Y, in the running of the freight train no.51720, got by the railway undertaking SNTFM „CFR Marfă” SA 4, consisted in the derailment of 4 wagons, loaded with ammonium nitrate (both bogies from the 17th, 18th and 19th wagons and one bogie from the 20th).

The investigation report was concluded on the 9th November 2017.

Direct cause, contributing factors

Direct cause of the accident was the fall between the rails of the right wheel (running direction) from the first axle (axle corresponding to the wheels 1÷2) from the wagon no.37802770232-3 (the 17th of the train), because the lack of fastening rail-sleepers in an area where the sleepers were replaced, this, under the dynamic loads transmitted by the rolling stock, allowed the increase of the gauge over the maximum accepted value of 1470 mm.

Contributing factors of the accident were:

- performance of works for the replacement of the wooden sleepers at the switch no. 4, one after another, without meeting with the railway safety conditions during the works;
- performance of maintenance without the permanent presence of a traffic safety responsible from the work performer;
- lack of surveillance of the works by a traffic safety responsible, appointed by the beneficiary, when the accident happened.

Underlying causes

- information sent by the management of the railway county to the working level staff, through the approval telegram on the condition for the line closing, were ambiguous and generated confusions.
- infringement of the provisions of the art.108 and 109 from the „Instructions for speed restrictions, closing of the lines and cut of power supply” no. 317/2004 concerning the asking of the line closing or the way to act if the approved works through the the closing telegram are not performed.

Root causes

The root cause of this accident was the lack of some procedures or provisions, in the basis units station/district concerning the performance of the works by economic operators outside the railway field and the non-identification of the dangers generated by:

- the performance of the track works without meeting with the safety traffic conditions stipulated in the practice codes, part of the safety management system;
- non-checking by the beneficiary of the works performed by the performer, for resuming the traffic;
- unsuitable communication between the representatives of the infrastructure manager and the staff of the economic operators that perform works at the track superstructure, with reference to the assurance of the traffic safety conditions along the performance of the works, and implicitly of their associated risks.

Additional remarks

During the investigation, some deficiencies and gaps were found out, without relevance for the conclusions on the causes, as follows:

- because the insufficient staff, in some days, when the gang foreman performs other tasks (fortnightly inspections, professional theoretical training, etc.), the gang management is ensured by a track worker, non-authorized and without medical and psychological tests for being foreman of the gang for the line maintenance. In a such way, the provisions of art.1-section 1 from the Order nr. 2262/2005 and art 5 from the Order of Minister of Transport 815/2010 were infringed and according the Government Decision 117/2010 it can be classified as railway incident (art.8, group C,point 3.4) – „the performance of the task by the staff with responsibilities in traffic safety without authorization, according to the specific regulations,for the performed activity or the operated equipment, during the period of time where the authorization is temporary ended or without having the valid medical and/or psychological, aptitude approval”;
- the approval telegrams for the line closing are not submitted to the movements inspectors for confirmation by signing.

Safety recommendations

Along the investigation some problems were found out, that, in the performing of the job tasks, can generate confusions for the workers, therefore the investigation commission considers that the infrastructure manager (obligation according to the provisions of the Government Decision no.581/1998, art.7 letter.b) to „assure the functioning of the public railway infrastructure ensuring the functioning of the line,equipments and other elements of the railway infrastructure according to the parameters established”),should take into account the Lessons for learning:

- a) the telegrams for the aproval of the line closing do contain clearly the name of the person who has to ask the line closing, especially for the cases where different economic operators work in the same area;
- b) strict drafting of some working provisions for all cases where it is approved the performance of railway infrastructure/superstructure maintenance with companies authorized by Romanian Railway Authority-AFER and authorized traffic safety staff

Taking into account the conclusions and the root cause of this accident, the investigation commission recommends Romanian Railway Safety Authority:

1. ask public railway infrastructure manager to review the safety management system and make a risk analysis for the cases where on the public railway infrastructure there are performed maintenance works with companies authorised by AFER and authorized traffic safety staff.
2. ask public railway infrastructure manager to analyze the oportunity to update its applicable regulations for the line closing, so do not exist ambiguities in the appointment of the traffic safety responsible for each part of the work.

3.4.33 The railway incident happened on the 23rd November 2016, at 01:40, in the railway county Timișoara, in the railway station Arad, during the shunting of the locomotive DA 352, got by the railway undertaking SC MMV Rail România, from the open line 1A to the line 12A1

occupied by 25 wagons (24 loaded with fuel and a buffer wagon, being in front of the train and empty), it seriously hit the rake of wagons stopped, damaging the first wagon and suspending it over the second wagon.

The investigation report was concluded on the 21st November 2017.

Direct cause:

The direct cause of the incident was the non-adjustment of the speed of the locomotive DA 352 at the shunting area necessary for its coupling with the stopped rake of wagons.

Contributing factors:

Performance of the safety service by the locomotive crew, being under the alcoholic beverages.

Underlying causes:

- infringement of the provisions from Instructions for the activity of the locomotive crew no.201/2007, art.179(3) and art.198(1) and from the Regulations for hauling and braking no.006/2005, art.5(3), according which the driver has to adjust the shunting speed so the locomotive can be stopped in the established place, without generating the rolling stock damage;
- failure to meet with the Regulations for the train traffic and railway vehicle shunting - no.005/2005, art.7, paragraph 1, concerning the checking of the train staff at the duty beginning in the railway stations where the railway undertaking have no own organization structure and Annex 2, chapter III – Tasks of the movements inspector for the filling and handling of the route sheet at the coming for service in the railway station of the locomotive crew art.5. paragraphs 2 and 5, letter a, it allowing to the locomotive crew to register randomly the activity program, without could be monitored.
- infringement of the Order of Transports, Tourism and Constructions , no.855/1986, concerning some measures for the consolidation of the discipline in the units of the Ministry of Transports and Telecommunications, art.1, which prohibits to the railway staff to bring into or drink alcoholic beverages, or to come to the work under the influence of the alcoholic beverages, as well as the provisions of the Instructions for the activity of the locomotive crew no.201/2007 art.12(1), letter b), according to which the locomotive crew is not allowing to transport and/or to drink alcoholic beverages during the shift, these can minimize the driving capacity.

Root causes:

None.

Additional remarks:

During the investigation of the railway incident one identified some nonconformities on the activity of the locomotive crew.

- the provisions of the Instructions for the activity of the locomotive crew no.201/2007, art.9(1), letter o) were not met, one did not perform all the operations stipulated by the specific instructions for the operation of the on-board locomotive computer systems and those for the traffic safety, that is the locomotive crew did not fill the identification personal data and the hauled trains.
- from the analysis of the activity of the locomotive DA 352, before its arrival in the railway station Curtici, on the 22nd November 2016, the investigation commission found that the driver which arrived with the locomotive in the railway station Curtici, before its shift end at 14:00 o'clock (on the 22nd November 2016), had drafted 6(six) consecutive sheet for the locomotive DA 352 (no.01274 – 01279), starting with 19:00 o'clock, from the 19th November 2016 and up to the 22nd November 2016, at 14:00 o'clock. Within this period of time of 67 hours, the driver was granted 5 rests outside the home (Milova, Curtici, Ilia, Mintia, Simeria Triaj) with a rest time between 2 and 3 hours, cumulating during this interval of time 13 hours rest and 54 hours work. Through this way of using the locomotive crew, the provisions of the Order of Minister of Transports nr. 256/2013 for the approval of the Norms for the maximum continuous work accepted for the locomotive, performed by the locomotive crew in Romanian railway system, art.8. - (1) that stipulates that when it is necessary to take rest outside the home, it

shall be equal, at least, with half of the previous time of work, and art.9 that stipulates that any rest at home can be followed, at least, by two consecutive periods of rest outside the home, that cumulated can not exceed 10 hours.

Measures taken:

- after the railway incident, taking into account the context where it happened, Romanian Railway Investigation Agency – AGIFER asked Romanian Railway Safety Authority – ASFR to suspend immediatly, up to the end of the incident investigation, the authorizations got by the staff involved in the incident occurrence, driver and train conductor.
- MMV Rail România SA started the next actions for the improvement of the monitoring and training of the safety staff:
 - establishment in the scheme for the job work for the positions of safety traffic inspector, traction trainer, wagon trainer, and the immediate occupation of the jobs;
 - registration at the course for the adult learning methodology in the railway field, organized by CENAFER, of the staff that is to assume the activity of practical and theoretical training of the staff with safety traffic responsibilities;
 - ensuring of the monitoring and practical and theoretical training of the staff with responsibilities in traffic safety, with own specialists and giving up to the practical and theoretical training that was supplied when the incident happened by CENAFER București, upon contract;
 - endowment of all training and control staff with breathalyzers for the control of the staff with responsibilities in the traffic safety during the training and control activities.

Safety recommendations:

Taking into account the cause and factors that generated the railway incident, as well as the measures taken by the railway undertaking MMV Rail România SA after the incident occurrence, both from administrative and organization point of view, the investigation commission considers that there is not necessary to issue some safety recommendation.

3.4.34 The railway accident on the 29th November 2016, at 13:40 o'clock, in the railway county Craiova, in the railway station Bârsești, at the shunting of the light locomotive EA 515 for its coupling at the locomotive EC 104 (both of them got by the railway undertaking SNTFM „CFR Marfă” SA), that was coupled at the freight train no. 81708-1, parked on the line no.5, consisted in the serious collision between these two locomotives Following the collision the driver of the locomotive EA 515 dead, the driver of the locomotive EC 104 was seriously hurt and the damages appeared:

- destruction of the body of the first wagon from the freight train no.81708-1;
- serious damage of those two locomotives and the derailment of the first bogie from the locomotive EC 104.

The investigation report was concluded on the 27th November 2017.

Direct cause:

The direct cause of the accident is the impossibility of the human operator to adjust the speed of the vehicle at the distance reserved for shunting, because the unsuitable working of the system for the operation of the dimmer of the locomotive EA 515.

Contributing factors:

- insecurity in operation of the equipment SAGMA 0,5/110 in case of failures in the internal equipment and/or in the electric scheme for the command of the dimmer where it is connected;
- inadequate protection against electro-magnetic interferences of the equipment SAGMA 0,5/110 in relation to the standards applicable in the railway field;
- connection without meeting with the provisions from the technical specification of the manufacturer, of the equipment SAGMA 0,5/110 in the electric scheme for the operation of the

dimmer by omitting the connection of the terminal connections 15 and 16 of the equipment, afferent to the levels 2 and 3 of the switch..

Underlying causes

- infringement of the requirements concerning the immunity of the electronic equipments in accordance with the standards applicable in the railway field;
- infringement of the requirement for the cabling of the equipment SAGMA 0,5/110, in accordance with the provisions from point 2.4 from the technical specification ST 04/2001.

Root cause

- wrong classification of the systems for the locomotive command in the category of railway products which failure generates serious railway interruptions (according to the provisions of the Minister of Transports' Order 290/2000, Annex no.3, at the class of risk 1B). It allows the use of the product without implementing some additional requirements imposed by the standards applicable to the railway critical products that, through their failure, could generate loss of safety and security of the transports specific to the class of risk 1A.

Additional remarks

1. Issues about the legislation application.

In Romanian railway transports, for the control of railway products/services, one applies the legislation for the homologation of a railway critical product, without using the certification of products/services. The homologation is the formal acceptance of a product on the railway market, limited recognition and approval of its serial production. The homologation is based on a technical reference documentation, accepted by a client and supposes the intervention of a neutral part in the relation between the supplier and the client, that makes an objective assessment.

The document regulating the railway technical homologation is the Minister of Transports' Order 290/2000, stipulating that in the railway transports, the products and/or services for the construction, modernization, maintenance and repair of the railway infrastructure and rolling stock, for their technical acceptance, have to be made by the economic agents authorized and surveilled, from technical point of view, referred to as railway suppliers.

According to the above mentioned Order 290/2000, AFER approved the technical documentation of the equipment *SAGMA 0,5/110*, presented by the manufacturer and accepted by the beneficiary, the approval given by the public institution being considered by parts like a homologation of a component from a locomotive type EA-060.

The locomotive EA 515 was equipped with *SAGMA 0,5/110* in 2003, when the railway supplier supplied the equipment to the manufacturer of the locomotive (SC ELECTROPUTERE SA) being in its custody for overhaul (RK). The manufacturer of the locomotive EA 515 had certification for technical homologation no. 449/2002 that allowed him to run the service „*Overhaul at the electric locomotive of 5100kW*”, code ST EP L 226/2000 (class of risk 1A). Because the manufacturer of the locomotive stopped its activity, the investigation commission could not establish the reason for which it appreciated to make constructive changes at the locomotive upon the homologation certificate, that was allowing it to make only repair. An overhaul, that supposes constructive changes at a locomotive, is possible only meeting with art.2, paragraphs 2 and 3 from the Order 290/2000, noway upon a homologation certificate of a service that certifies only the capability of the economic agent to run the service on a product that was previously changed.

Nowadays, for the railway vehicles, other than the wagons, the Order 635/2015 *is applied in relation to a system for the certification of the entities in charge with the maintenance*, that stipulates that the methodology applied is drafted according to the principles stipulated in the Regulations (UE) no.445/2011 of European Commission. At art.3 from the paper of the railway authority is stipulated that „*the railway supplier authorizations, certificates for railway technical homologation and the railway technical agreements issued until the date of coming into force of the present order for the economic operators by Romanian Railway Authority - AFER, in accordance with the national legislation, will stay valid during their validity period of time, but no later than 1 year, for the entities in charge with the maintenance, respectively 2 years, in the situation of the workshops*”. So, for the repairs of the railway vehicles, other than the wagons, irrespective of their complexity, performed by a *railway supplier*, according to the Order 290/2000, or the *economic agent*, in the meaning of the

Order 635/2015, gets instead the documents stipulates by the Order 290/2000 (railway supplier authorization, railway technical homologation certificate and railway technical agreement) a document proving the certification of the entity in charge with the maintenance and of the workshop, their capability to „ensure, supported by a maintenance system, that the railway vehicles, other than the wagons for which maintenance is responsible, is in safety operation condition”. The provisions of those two legal papers generate a confusion because „the maintenance system” is not the same concept as „service homologation”. According to the Regulations (UE) no.445/2011 of European Commission the certification of a maintenance system supposes the assessment of the applicant capability to *manage* the maintenance activities and it is not the same with *the homologation of each activity*.

European legislation concerning the products introduced into the community market is based on the risk concept and stipulates that each product supplied must have no unacceptable risk of physical injury or affecting the people health, either directly or indirectly. The responsibility for the conception, design, manufacturing or maintenance is in the complete charge of the manufacturer of the equipment or vehicle. By the Law no.157 from the 25th May 2005 for the ratification of the Accession Treaty, Romania took the commitment to transpose into the national legislation all provisions of European Legislation about product safety, its surveillance and compliance, including in the regulated railway field.

In order to achieve this goal, in European Union, the certification of railway product/service is important part of the process within which one analyzes the significant dangers for the equipment and for any command system, associated to its intended operation area, that have to be identified by the developer of the technical specification, through an analysis of the dangers. This analysis establishes if the functional safety of the product is necessary to ensure a proper protection if any significant danger appears. The Directives and Standards approved by European Union define the properties of a product and establish the preventing measures (requirements) that have to be taken for the protection of human being, machines and equipments.

Taking into account these above mentioned, the investigation commission considers necessary the development of a set of legal rules, that apply the principles of European one and make responsible the economic agent of products, applying and proving the significant requirements of health and safety concerning the design and manufacturing of the railway technical equipments (infrastructure and vehicles). Following it, at the design and manufacturing of the railway equipments should take into account the results of a *risk survey*. Though the iterative process of *risk analysis* and the study of the *risk decrease*, the manufacturer has to:

- establish the equipment limits, including the anticipated destination and any other possible improper use;
- identify the dangers that can be generated by the equipment and the dangerous situation associated to them;
- estimate the risks, taking into account the seriousness in relation to the possible injuries or health affecting and the probability of their appearance;
- assess the risks, in order to establish the need to decrease the risk in accordance with the goal of the railway legislation on the safety level;
- remove the dangers or decrease the associated risks by the application of the protection measures, meeting with the principles for the railway safety integration.

2. Issues about the functional safety of E/E/EP equipments.

The systems consisting in electric/electronic/electronic programmable (E/E/EP), based on microprocessors and used in activities to meet with safety functions and intended to assure the human being protection, has to offer the guarantee that it assure the decrease of risks necessary to ensure the safety of the equipment that could be danger generator. The functional safety of E/E/EP is the ability of a safety system to run the necessary actions or to keep the safety condition for the equipments being under control. The functional safety is a part of the global security and it is assured by a equipment or a system that has to work properly, that meets with the inputs.

In order to comply with this requirement, it is published a generic standard IEC 61508-1998, transposed into Romanian legislation by SR CEI 61508-2001, cancelled by SR EN 61508-2002 and

reviewed once time in 2011, that offers methods for meeting with the requirements necessary to get the type of functional safety. IEC 61508 is intended to be a standard, basis in the functional safety, applicable to all types of equipments E/E/EP and industry systems.

According to IEC 61508, the manufacturer of the equipment E/E/EP has to run a risk analysis that implies the analysis and identification of the safety functions, determining the safety integrity level (SIL – Safety Integrity Level). SIL is the reliability of a system or equipment to perform a safety function, with the probability of appearance of a dangerous failure during a hour. The standard covers a life cycle of a equipment and offers guiding in a series of approaches, one of them, through the quantitative analysis of the dangers, is based on six categories of risk appearance and four consequences that are combined in a risk matrix. In 2003, there was the appearance as specific standard in the railway field *SR EN 50126-1:2003-Specification and demonstration of the reliability, availability, maintenance and safety (FDMS)*, it transposing the generic standard SR EN 61508 for the railway field.

After reading all the documentation submitted by the manufacturer of the equipment SAGMA 0,5/110 (ST-04/2001 of the equipment, „System for the operation of the dimmer with asynchronous motor SAGMA - 0,5/110”, chapter „1.9 Reference documents”), one found out that it does not take into account the standard on the functional safety of the equipment, although its publishing its taking over by ASRO.

It is special issue that neither the beneficiary of the equipment SAGMA 0,5/110 fitted on the locomotive type EA 060 did not ask for the insertion of some reference standards for this essential requirement (functional safety), especially that in 2003 it had in its operation activity an accident in the railway station Coşlariu, whose occurrence was identical with that from the railway station Bârseşti.

3. Issues about the electromagnetic compatibility.

All the devices, installations or equipments E/E/EP influence each other when they are interconnected or put close each other. Similarly, a lot of elements both from the railway vehicles with electronic control and from the infrastructure running on, any interference could generate malfunctions. So, it is important to asses the quality and functional safety of those systems, using the regulations for electromagnetic compatibility. It is defines as being a capacity of an electric device to work properly in its electromagnetic environment, without that this environment, that is also of other devices, be interferred inadmissibly.

The purpose of the electromagnetic compatibility tests is to keep a reasonable level of control on the secondary effects. At the international level, the standards for electromagnetic compatibility were drafted for two reasons. Firstly, they regulate the electromagnetic emissions of the devices, and secondly ensure the immunity of the respective device against the electromagnetic interferences. The electromagnetic immunity is the aptitude of a device, equipment or system to work according to the designed parameters in the context of electromagnetic interferences. In a railway vehicles the interference source can be its electric traction systems and the interfered system can be the system for the operation of the dimmer, that can be with DC or AC motor.

Taking into account the solution adopted by the locomotive owner and by the manufacturer of the equipment SAGMA 0,5/110, the risk of interferences of the equipment is higher than the existing classic solution (in DC), so the manufacturer had to demonstrate the beneficiary of the product the electromagnetic immunity of it against the traction system of the locomotive EA 515. The channel for the transmission of this interference could be by conduction (direct by electric contact of the connection cables) or by induction in close field (electromagnetic or electrostatic) and with a lower probability in a remote field (electromagnetic radiation).

Measures taken

After the accident, AGIFER asked the railway undertakings to identify the locomotives provided with the equipment for the operation of the dimmer LE type SAGMA 0,5/110, manufactured by SC INDA SRL and control the equipment from the installation for the locomotive command.

Simultaneously the railway freight undertaking SNTFM ”CFR Marfă” SA asked the withdrawal from operation of all electric locomotives provided with equipment for the operation of the dimmer LE type SAGMA 0,5/110 manufactured by SC INDA SRL.

Safety recommendations

With reference to the accident happened on the 29th November 2016, in the railway station Bârsești, consisting in the collision between the locomotive EA 515 and the locomotive EC 104, leading to the death of the locomotive drivers and important damages at the rolling stock, one found out that the impossibility of the human factor to adjust the speed at the distance for shunting, because the improper technical system was due to the favouring factors stipulated at „D.1. Direct cause and contributing factors”. It is the consequence of the technical approach of the railway critical product SAGMA 0,5/110, that was designed, manufactured, tested and checked for meeting with all the requirements, according to the permissive legislation, that is the Order 290/2000.

Taking into account that the change of the command circuit was made only at the electric locomotives manufactured SC ELECTROPUTERE SA, that had a safety system before the change, and in order to avoid some accidents with similar causes, with victims and locomotive destruction, it is necessary that those equipments new introduced be designed, manufactured, tested and checked in order to meet with the requirements of the class of risk 1A, railway products whose failure can lead to the loss of transport safety and security, implying the next risks:

- risk of railway accident, that can generate injuries of the railway staff or of the passengers;
- risk of major destruction of the railway equipments or carried goods.

In the railway system, the transported masses are very big and the lack of control of all technical and organization issues can lead to railway accidents with victims, equipment and vehicle damages and high social costs. From this reason, this activity has to be a regulated field, where it is indicated and necessary to be a control of each product intended for transport and of the services for the maintenance of the railway equipments and vehicles. The capacity of an economic agent to organize the maintenance along the designed life time of a railway vehicle, can be based on procedures concerning the periodicity, submission of the documentation, enumeration of the operations specified by the manufacturer, etc., that has to be certified by an authority from the safety field and has not be confused with the homologation or certification of a service of repair or revision, that implies the certification by an independent body of an economic agent, in the sense that it has the capacity (resources, technical endowments and manufacturer know-how) to perform all the operations stipulated by the vehicle manufacturer, so its right operation be guaranteed and to minimize up to the reasonable limit the system failures.

In Romanian legislation there is a certification system of the entities in charge with the locomotive maintenance specified through the Order no.625/2015, that applies the principles of the Regulations (UE) no.445/2011 and asks every economic agent, that wants to perform „maintenance” the compulsoriness to be certified by an authority in the field. The Regulations (UE) no.445/2011 does not mention issues about „repair” of a railway vehicle (ex: type RK, etc.), that imposes an activity more complex than the maintenance one and where the replacement of some systems or subassemblies, hose quality has to be like that specified by the manufacturer, but also a higher capacity of the economic agent concerning the resources, technical endowments and manufacturer know-how.

Homologation of each part, subassembly or system of a railway vehicle introduced in operation, has to get the agree of the vehicle manufacturer, if it is not a supplier of the manufacturer, because only this knows in detail the technical issues about the requirements necessary for the functional safety of the product. Putting in operation is a concept concerning structural subsystems and their components, applicable for the interoperability of European railway transport system. For operation, that does not imply interoperability of Romanian railway transport with European Union one, there is internal legislation applicable.

The job of driver is a very complex one, because it needs a permanent concentration in order to receive and interpret the messages sent by the railway transport system, along the time it becoming working routines. The new situations, surprizing the driver, dangerous for the railway activity, induce a risk, difficult to be quantified for the railway safety, because the reactions of the human operator are difficult to be anticipated. It is important that in the continuous professional training process the drivers be informed about a series of dangerous hypothetical situations, so they can establish action schemes for dangerous hypothetical situations, that ce be use quickly if necessary.

Taking into account these above mentioned, AGIFER recommends ASFR to be sure that:

1. the railway critical products from the circuit for the command of the electric locomotive dimmer, shall be included in the class of risk 1A – railway products which failure leads to the loss of transport safety and security;
2. until the implementation of the recommendation no. 1, the electric locomotives manufactured by SC ELECTROPUTERE SA, submitted to changes at the circuit for the command of the dimmer against the homologated one at the manufacturing, shall not be accepted in operation only after disposing ensuring measures necessary for the railway safety;
3. the legislation for the homologation of the products and repair services shall be reviewed so it does not conflict European provisions concerning the certification of the entities responsible with the maintenance, other than the wagons.
4. theoretical training for unusual and dangerous situations is joined by practical training, in a simulator, so the human operator deals with some unusual situations in order to get skills for action appropriate them.

3.4.35 The railway accident happened on the 29th November 2016, at 17:50 o'clock, in the railway county Constanța, in the railway station Neptun, consisted in a fire burst into the multiple unit AM753, that ran like passenger train no.8389, got by the railway undertaking SNTFC „CFR Călători” SA. Following the fire, the driver suffered burns on the hands, and the multiple unit was seriously damaged, about 50%.

The investigation report was concluded on the 22nd November 2017.

Direct cause

The direct cause of the fire was the ignition of the diesel drained because the crack in the brass part of the metallic pipe from the fuel supply circuit, that reached the over-heated areas of the diesel engine and on the evacuation channels of the burnt gases

Contributing factors

- loss of the screw with nut at one of those 4 elastic fastening points of diesel engine on the bogie frame, that led to the raise of the vibrations at the pipe from the diesel supply circuit, generating its cracking;
- non-ensuring of the mechanical resistance of the metallic pipe from the supply circuit according to the provisions from "DRAFT OF THE DIESEL CIRCUIT" code R4.1486, using an under-size pipe;
- unsuitable drafting of the technical documentation necessary for the diesel circuit, respectively there are no drawings with execution details about the diesel circuit achievement;

Underlying causes

One did not meet with the provisions from "DRAFT OF THE DIESEL CIRCUIT" code R4.1486, made by SC RELOC SA Craiova, using in the supply circuit a metallic pipe with $\Phi 18 \times 1,5$ instead $\Phi 22 \times 2,9$.

One did not comply with the provisions of the Minister of Transport's Order OMT 290/2000 annex no.3, art.5 paragraph 2 and art.12 letter b, that is SC RELOC SA Craiova did not ask the approval of the beneficiary and of Romanian Railway Authority - AFER for the technical solutions used for the product manufacturing, according to the change sheet no.1 (drawings for the tank, pipe routes, etc.). One did not comply with the provisions of the Government Decision no.877/2010 concerning the interoperability of the railway system, art.20(1) concerning the getting of the authorization for putting in operation at the exit from repair type RG, with the modernization of the multiple unit AM 753.

Root cause

None.

Additional remarks

We emphasize that the fires in the motorized rolling stock are ones class B (of liquids type petrols, oils, ether, crude oil, etc.) and according to the classification from „Guide on the technique and tactics for the fire extinguishing– Ministry of Internal Affairs, București 2013” at the intervention for the

their extinguishing, the most effective extinguish agents are the powder for the low intensity fire and foam for the surfaces burning on large surfaces.

Measures taken

SNTFC "CFR Călători" SA, following AGIFER paper no.1128/18/09.06.2017 issued the Disposal no.D31/4/533/19.06.2017 asking for the the control of the fuel equipments at all multiple units of 4 axles series 700 and 1000. Following this disposal all the multiple units series 700 and 1000 were checked. At the multiple units in operation no diesel leakages were found out and at the multiple units AM 779 and AM 785 the metallic pipes making the connection between the diesel tank and the diesel pre-filter with flexible connections of high pressure were replaced.

Safety recommendations

During the investigation, according to the submitted documents, the investigation commission found out that there is a problem in purchase process of the multiple units that were submitted for repair type RG with modernization, that is the documentation for the modernization of the multiple units was not assimilated by the beneficiary and AFER, and there are differences between the provisions of the execution documentation of the supplied product.

Taking into account these above mentioned, the investigation commission recommends Romanian Railway Safety Authority – ASFR to undertake the necessary actions so that in the process for the construction changes (modernizations) of some structural subsystems of the motorized rolling stock, such situations be removed through:

- assimilation by the beneficiary and by AFER of the technical changes made by the supplier;
- checking by the beneficiary and by AFER of the conformity of the manufactured product against the execution documentation;
- specific measures identified by the beneficiary for keeping under control the possible risks generated in the operation of the rolling stock, following the constructive changes made at the rolling stock.

3.4.36 The railway incident happened on the 25th December 2016, at 15.45 o'clock, in the railway county Timișoara, in the railway station Șofronea, consisted in the hit of the covers of the operation and control bars from the switch no.4, of the system ELP from the switch no.3 and of the impedance bod of the section 013C, by the light locomotive EA 389, running as train no.79818 (got by MMV Romania).

The investigation report was concluded on the 19th December 2017.

Direct cause:

The direct cause of the incident was the exceeding of the gauge for the elements of the railway equipments by the slack adjuster SAB, from the axle no.4 of the locomotive, following its detachment in two pieces, hitting the equipments and the mechanisms of the switches situated between the rails.

Contributing factors:

- lack of the control device and of the coupling bar from the slack adjuster SAB, from the axle no.4;
- lack of the safety cable, for ensuring against fall, slack adjuster SAB, from the axle no. 4.

Underlying causes:

- infringement, at the planned inspection type R1, on the 24th November 2016, of the Technical Specification drafted by SC Constantin Grup SRL, cod ST 061 – LE 5100 kW, Periodical repairs, locomotive LE 5100 kW, cap.2 – mechanic and pneumatic part, point 6, concerning the checking of „ slack adjuster SAB”;
- infringement at the intermediary inspections (PTh3), on the 11th December 2016 and on the 20th December 2016, of the Technical specification drafted by SC CFR SCRL Brașov SA, code ST 5 - 2004, Planned inspections type PTh3, RT, R1, R2, at the electric locomotives of 3400/5100 kW, chapter B – mechanic part, points 3 and 4, concerning the necessary works at „brake rigging” and „ slack adjuster SAB”;
- infringement at the intermediary inspection, on the 4th December 2016, of the Technical specification drafted by SC CFR IRLU SA, code ST 5 – LE 5100 kW-Rev, Planned inspections

type PTAE (PTh), RAC, RI, RT, R1, R2 at the electric locomotives of 5100 kW. List of terms for the intermediary inspection (RI), chapter A – Mechanic part, point 6, concerning the checking necessary to be made at the „brake rigging”;

- infringement of the provisions from Instructions for the activity of the locomotive crew no.201/2007 Annex 4 art.2 paragraph (5), with reference to the obligations of the staff with responsibilities in the checking and certification of the technical condition of the locomotives at their exit from the traction units for the train hauling;
- infringement of the provisions from the Instructions for the locomotive crew no.201/2007 art.40 letters a) and e), that prohibit the putting into operation of locomotives for train hauling or for shunting, with the braking equipments and the parts of the brake rigging, including the fuses of the brake rigging, missing or out of service).

Root causes:

None.

Additional remarks:

During the investigation of the railway incident, one found out some non-conformities on the putting into service of the locomotive EA 389, on the 25th December 2016, without connection with the causes of the incident occurrence.

- the provisions of the Instructions 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 operation of the computerized systems and of the traffic safety ones, on the locomotive board were not performed, that is the locomotive crew did not input the data for the identification of the staff and of the hauled trains.

Safety recommendations:

None.

3.4.37 The railway incident happened on the 27th December 2016, at 08:30 o'clock, in the railway county Iași, between the railway stations Tutova and Bârlad, consisted in the hit of the track inductors of 1000/2000 Hz și 500 Hz afferent to the signal Bl 5, by a part detached from the locomotive DA 863, hauling the train no.1831, got by the railway undertaking SNTFC „CFR Călători” SA.

The investigation report was concluded on the 4th May 2017.

Direct cause:

The direct cause of the railway incident was the entrance into the structure clearance of the set for the operation of the pump for the lubrication of the flange of wheels.

Contributing factors:

The factor contributing at the railway incident occurrence was the keeping in operation of the locomotive DA 863 over its time norm for the performance of the planned repairs, it leading to:

- wear over 60% of the a thread of the screw from the operation axle of the device for the lubrication of the flange of wheels;
- detachment of the nut for the fastening of the mechanism for the operation of the lubrication pump and the breakage of the bolt for the joint of the rod on the lever for the pump control;
- distortion of the threaded area of the axle for the operation of the pump for the lubrication of the flange of wheel, ensuring the mobile connection between the parts of the ensemble;
- change of the ensemble for the operation of the pump, covering the roller with a metallic disc, put over the roller case.

Underlying causes:

- Infringement of the cycle of compulsory repairs at the locomotive, according to the provisions of Railway Norm N.F. 67-006:2011 "Railway vehicle. Types of planned inspections and repairs. Norms of time or km run for the performance of the planned inspections and repairs", approved through Order of Minister of Transports and Infrastructure no.315/2011, amended through Order of Minister of Transports and Infrastructure no.1359/2012, as follows:

- subpoint 3.1, that is the locomotive DA 863 was not withdrawn from traffic at the achievement of the norm of time stipulated for the performance of the planned repairs;
- table 3.1, letter A, position no.3, that is the cycle of planned repairs for the locomotive DA 863 was not met;
- infringement of the provisions from „Work schedule” from the technical specification code ST 6 – 2004 edition 2 Revision 1 „Planned inspections type PTh3, RT, R1, R2, 2R2 and R3 at the diesel-electric locomotives of 2100 HP”, that is, one did not carry out within the planned inspections all the operations mentioned at point 15;
- infringement of the provisions from the Instructions for the activity of the locomotive crew no.201/2006, approved by Order no.2229/2006, respectively art.41, paragraphs (4) and (5), with reference to the locomotive failure;
- infringement of the provisions from the Investigation Regulations art. 16. Points a and b, art. 22 paragraphs (2) and (4).

Root causes:

None.

Safety recommendations:

None.

3.4.38 The railway accident happened on the 30th December 2016, at 05:35 o'clock, in the railway county Cluj, track section Beclean pe Someş – Deda (electrified single-track line), between the railway stations Beclean pe Someş and Şintereag, km.26+100, consisted in the derailment of the first axle of the first bogie, from the locomotive EA 188, hauling the passenger train Regio no. 4107, got by the railway undertaking SNTFC „CFR Călători” SA, derailed in the running direction.

The investigation report was concluded on the 24th August 2017.

Direct cause:

The direct cause of the accident was the fall of the left wheel of the guiding axle from the electric locomotive EA 188 between the rails, this wheel running on the exterior rail of the curve. It happened because the increase of the gauge, over the accepted tolerances, 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 elements for the fastening of the rails on the concrete sleepers from the area of the point „0”, that under the action of the dynamic forces sent by the wheels of the rolling stock, allowed the displacement of the exterior rail of the track, to the increase of the gauge;
- inadequate sizing of the working staff existing in the district, in charge with the maintenance of the railway infrastructure at the accident site;
- non-ensuring of concrete sleepers necessary for the track maintenance and repair.

Underlying causes

- infringement of the provisions of art.2, sheet no.3 and of art.3, sheet no.4 from „Instruction 305/1997- for the establishment of terms and order for the performance of the track inspections”;
- infringement of the provisions of art.25, paragraphs (1), (3) 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 concrete sleepers which failures impose it;
- 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 manpower norm for the manual current maintenance.

Root cause:

The root cause of the accident was the partial application of the operational procedure code PO SMS 0-4.07 „Compliance with the technical specifications, standards and requirements relevant for the 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 sub-units in charge with the maintenance of running line between the railway stations Beclean and Şintereag and that the unsuitable sleepers have to be replaced or repaired.

Safety recommendations

The derailment of the first axle of the locomotive hauling the passenger train no.4107 happened because the inadequate maintenance of the railway infrastructure.

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

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

3.4.39 The railway accident happened on the 31st December 2016, at 05:45 o'clock, in the railway county Braşov, line 400, track section Siculeni - Deda (electrified single-track line), between the railway stations Izvoru Oltului and Izvoru Mureşului, km 122+120, consisted in the derailment of the first bogie from the trailer wagon RE 012 of the passenger train Regio nr.4504, consisting in two electric train sets RE 011 and RE 012 (got by the railway undertaking SNTFC „CFR” Călători).

The investigation report was concluded on the 19th December 2017.

Direct cause

The direct cause of the accident was the overclimbing of the active shoulder of the gauge face from the exterior rail of the curve, by the leading wheel (right one in the running direction of the train) of the axle no.5 from the trailer wagon no.58-0112-1, because the increase of the ratio between the lateral forces appeared at the contact wheel-rail and the load acting on that wheel, exceeding the derailment stability limit.

Increase on the ratio between the lateral forces and the load acting on this wheel happened because the transfer of the load of that wheel and increase of the lateral force (guiding) of that wheel acting on the exterior rail.

Contributing factors:

- lack of a suitable lubrication at the central pin wagon body – carrying bogie at the trailer wagon derailed, it leading to the increase of the lateral guiding force transmitted by the wheels of that bogie to the exterior rail of the curve;
- keep in service of the train set Z6100, matriculation no. 58-0012-3 and of the trailer wagon 58-0112-1 with a technical potential that did not ensure the safety conditions, comfort and traffic security, after exceeding the time norm, imposed for the performance of the planned repairs;
- cumulation, under the action of the dynamic forces transmitted to the rails by the wheels of the rolling stock, of the effects generated by the track geometry failures, it led to the load transfer of the carrying bogie from the trailer wagon derailed.

Underlying causes

- infringement of the provisions from point 3.1 from the Railway Norm "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 the Order of Minister of Transports and Infrastructure OMTI no.315/2011, amended through no.1359/2012, concerning the withdrawal from operation of the railway vehicle for planned repairs;

- infringement of the provisions from the tabel no.3.1, point A.8 from the Railway Norm "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 the Order of Minister of Transports and Infrastructure OMTI no.315/2011, amended through no.1359/2012, concerning the time norm for the performance of the inspections and repairs at the electric train sets type Z 6100;
- infringement of the provisions of art.7, point A.1. from „Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989”, concerning the tolerances accepted for the cross level of a rail against another one.

Root causes

The root cause was the lack in the procedure „Planning of inspections and repairs for locomotives, multiple units and electric train sets got by SNTFC „CFR Călători” SA – code PO-0-7.1-14”, drafted in 2012, document part of the safety management system of the railway undertaking, of a provisions stipulating the obligation to withdraw from operation the motorised railway vehicles for planned repairs when they reach the time norms (days, months, years) or the norms of run km, as it is stipulated in the reference document (OMTI no.315/2011).

Additional remarks

During the investigation, one found out a non-conformity in the maintenance of the railway infrastructure, without relevance for the conclusions on the accident caues, as follows: expansion joints before the mark „0” had values of 11 mm for the exterior rail and 10 mm for the interior one, at a measurement temperature of -10°C, exceeding with 2 mm, respectively 3 mm the accepted tolerances from the table 12 and chapter I, art.10, letter B, point 2 from ”Instruction of norms an tolerances for the track construction and maintenance – lines with standard gauge no.314/1989”.

Safety recommendations

On the 31st December 2016, between the railway stations Izvoru Oltului and Izvoru Mureşului, the fist bogie from the second wagon of the train Regio nr.4504, consisting in two electric train sets type Z 6100, derailed.

During the investigation, one found out that the derailment happened because the lack of lubrication at the central pin wagon body – carrying bogie, from the derailed bogie, it could be generated also by the maladjustment of the technical specification ST18/2007 for the maintenance performance at the electric train sets Z6100, for the control of the risk that this ensemble be not lubricated a long period of time.

One also found out that the railway vehicle derailed had no technical potential to ensure the safety conditions, comfort and traffic security, having the time norm imposed for planned repairs exceeded. In the procedure „Planning of inspections and repairs at locomotives, multiple units and electric train sets got by SNTFC „CFR Călători” SA – code PO-0-7.1-14”, drafted in 2012, there is not stipulated the obligation to withdraw from operation the motorised railway vehicles for planned repairs when they reach the time norms (days, months, years) or the norms of run km, as it is stipulated in the reference document OMTI no.315/2011.

1. Taking into account these above mentioned, in order to decrease the risk to keep in operation railway vehicles after reaching the time norms (days, months, years) or thenorms of run km for the planned repairs, the investigation commission recommends Romanian Railway Safety Authority – ASFR to ask railway undertaking the revision of its own safety management system, drafting some procedures whose provisions be put in conformity with the national an European norms in force.
2. Decreasing the risk that the area of the central pin wagon body – carrying bogie not be lubricated for a long time, the investigation commission recommends Romanian Railway Safety Authority – ASFR to ask the economic operator Societatea de Reparații Locomotive „CFR-SCRL Braşov” SA the revision of the technical specification for the maintenance of the electric train sets type Z 6100.

3.4.40 The railway accident happened on the 1st January 2017, at 02:55 o'clock, in the railway county Braşov in the railway station Braşov Triaj, at the stabling of the freight train

no.50480-1 (got by the railway undertaking SC UNICOM TRANZIT SA), hauled by the locomotives EA 212 and EA 223 (a banking one), on the line no. 9, consisted in the derailment of the first axle from the locomotive EA 223 over the switch no. 47 .

The investigation report was concluded on the 28th December 2017.

Direct cause

The direct cause of the accident the overclimbing of the lateral active side of the rail head by the flange of left wheel from the first axle in the running direction, because the increase of the ratio between the guiding force and the load acting on this wheel, exceeding in a such way the derailment stability limit. This increase was generated by:

- load transfer of the wheel no.2, generated by the track twist on the deflecting section of the switch, cummulated with the load transfer between the wheels of the first axle in the running direction of the locomotive amplified in dynamic condition;
- increase of the angle attack of the wheel no.2 from the first axle, because the value on the Oy axis within the switch no.47, that in the point Y6 was with 5 mm under the minimum value of the accepted operation tolerance.

Contributing factors

- keeping in operation of the switch with components and geometric element that did not meet with the accepted tolerances;
- keeping in operation of the locomotive EA nr.40-0223-0 with a technical potential that did not ensure the safety conditions and traffic security, after exceeding the time limit imposed for the performance of the planned repairs and with a noise abnormal at the bogie no.1, non-removed.

Underlying causes

- infringement 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 tolerances accepted against the gauge established for switches;
- infringement of art.19.6 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 limit established for the switches;
- infringement of art.1, point 14.1, letter c from Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989 concerning the variation of the deviations from the gauge, accepted in operation, expressed in mm/m;
- infringement of art.7.4 from Instruction of norms and tolerances for the track construction and maintenance – lines with standard gauge - no.314/1989 concerning the values accepted for track twist;
- lack of compliance with the values established in the catalog „Switches APCAROM, edition I – 1983”, for the the value on the Oy axis of the exterior connection rail of the curve of the diverging track of the switch no.47 with the technical characteristics: type 49, gauge 1435 mm, radius R = 300 m, tangent 1/9, flexible points, left deviation;
- infringement of the provisions of the Railway Norm "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 the Order of Minister of Transports and Infrastructure OMTI no.315/2011, amended through no.1359/2012, point 3.1, for withdrawal the locomotive from operation for planned repairs;
- lack of compliance with the time norms for the performance of inspections and planned repairs stipulated in the Railway Norm "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 the Order of Minister of Transports and Infrastructure OMTI no.315/2011, amended through no.1359/2012, table 3.1.

Root causes

- infringement of the technical specifications, standards and requirements relevant for the whole life cycle of the lines in maintenance process”, part of the safety management system of the railway public infrastructure manager CNCF „CFR” SA, concerning the performance of maintenance and periodical repairs at the lines;
- the operational procedure for the maintenance of the locomotive stock got by the railway undertaking does not stipulate the need and periodicity of the planned repair performance.

Additional remarks

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

- the locomotive was not provided with mirrors, against the provisions of Instructions for the activity of the locomotive crew no.201, art.40, letter n;
- in the on-board register there was written down that the device for the lubrication of the wheel flange is out of service, on the 19th November 2016, without being repair until the accident, although the locomotive entered many times in traction units from this moment until the accident;
- on board register from the locomotive at the moment of the accident occurrence was not sealed in accordance with the provisions of order DTV no.17/RLH/2372/1981;
- the running and shunting speed on the line no.9, group A, railway station Braşov Triaj, was limited at 5 km/h. The speed restriction was introduces on the 16th November 2016, following the technical condition of the line (218 sleepers unsuitable, rails with the supporting strength exceeded, about 25%, chocked broken stone track bed about 30%) and there was no perspective of works for decresing these parameters for the train traffic and shunting with the established speed;
- lack of some spare parts necessary for the current maintenance of the lines;
- insufficient labour against the established one forvthe current maintenance of lines.

Safety recommendations

During the investigation, one found out that the locomotive involved in the accident had not the technical potential that ensure the traffic safety and security, having the time norm for the performance of the planned repairs exceeded, against the provisions of the Order of Minister of Transports and Infrastructure OMTI no.1359/2012 for the amendment of the Railway Norm "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 the Order of Minister of Transports and Infrastructure OMTI no.315/2011, it favouring the accident occurrence.

Also, during the investigation, concerning the safety management system of the railway undertaking SC UNICOM TRANZIT SA, one found out the next nonconformities:

- the operational procedure for the maintenance of the locomotive stock does not refer also to the need and periodicity of the planned repair performance;
- within the assessment of the risks associated to the specific activities, one did not identify the danger resulted from the non-withdrawal from operation of the locomotives for their submission to planned repairs.

Taking into account these above mentioned, the investigation commission recommends Romanian Railway Safety Authority to ask to the railway freight undertaking the revision of the safety management system, drafting some procedures for the performance of a risk analysis in accordance with the national and European norms in force for the control of the risks associated to the railway operations.

3.4.41 The railway incident happened on the 14th February 2017, at 22:26 o'clock, in the railway county Braşov, track section Simeria - Coşlariu (electrified double-track line), in the railway station Şibot, consisted in the wrong setting of the exit route by the movements inspector on duty, for the train IR no.1838 (got by the railway undertaking SNTFC „CFR Călători” SA).

The investigation report was concluded on the 3rd April 2017.

Direct cause:

The direct cause of the incident was the the non-operation of the individual shunting and the non-performance of the checking of the control of the position of the switch no.15, from the exit route, for the passenger train IR no.1838 from the line III of the railway station Şibot to the railway station Blandiana, on the track I.

Contributing factors:

None.

Underlying causes:

The underlying cause of this incident was the non-meeting with the provisions of the Instruction for the operation of the equipment CED type CR3 Domino from the railway station Şibot, art.49, with reference to the dispatching way of the trains with the exit signal on "Stop position", upon the running order, respectively to the individual operation of the switches and to the checking of the control of their position from the end of the railway station, respectively through the buttons for the control of the switch position.

Root causes:

None.

Additional remarks:

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

- after the incident occurrence, the train was withdrawn in the railway station and routed again, without the involved staff (movements inspector, driver and train conductor) meet with the provisions from the Investigation regulations about the proceeding in case of some accidents/incidents.

Safety recommendations:

None.

3.4.42 The railway accident happened on the 4th March 2017, at 14:00 o'clock, in the railway county Bucureşti, track section Titu - Târgovişte (non-electrified double-track line), at the stabling of the train no. 92051 (got by the railway undertaking SNTFM „CFR Marfă” SA), on the line 7 of the railway station Târgovişte, consisted in the derailment of two wagons of the train (all axles of the 7th wagon, and both axles of the first bogie from the 8th wagon)

The investigation report was concluded on the 18th December 2017.

Direct cause:

The direct cause of the accident is the fall between the rails of the right wheel (inside rail of the curve within the connection rails) of the guiding axle from the wagon no.31802771994-3, the 7th one of the freight train no.92051. It happened because the increase under the load of the track gauge, over the maximum accepted value, following the lateral movement of the rail from the outside track of the curve, under the action of the dynamic forces transmitted to the track by the running rolling stock.

Contributing factorst:

- unsuitable technical condition of the wooden sleepers from the point „0”, that under the action of the dynamic forces transmitted by the wheels of the rolling stock, did not permit the fastening of the coach screws for fixing the metallic plates, so the gauge value increased over the maximum accepted value of 1470 mm;
- insufficient labour and quantities of materials for the maintenance of the railway infrastructure;

Underlying causes

- infringement of the provisions from the art.25, paragraphs (2) and alin.(4) of „*Instruction of norms and tolerances for the line construction and maintenance, for lines with standard gauge no.314/1989*”, concerning the failures that imposed the replacement of the wooden sleepers and the non-acceptance of keeping unsuitable wooden sleepers within the switches;

- infringement of the provisions from the point 4.1. of the chapter 4 „Norms of manpower and material consumption”, from the „*Instruction for line maintenance no.300/1982*” concerning the ensuring of the manpower norm for the current hand maintenance.

Root cause:

The root cause of the accident is 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 maintenance process”, part of the safety management system of CNCF „CFR” SA, with reference to the sizing of the staff from the Line District L5 Târgoviște, in connection with the works.

Safety recommendations

The derailment of those two wagons of the freight train no.92051 happened because the unsuitable maintenance of the railway infrastructure.

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

Taking into account the factors contributing the accident occurrence, factors 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 to issue some safety recommendations.

3.4.43 The railway incident happened on the 8th February 2017, in the railway county Iași, in the railway station Suceava, consisted in the passing of the shunting signal M20 on stop position, without the locomotive EA 650, got by the railway undertaking SNTFC „CFR Călători” SA, meet with the specific regulations, followed by the derailment of all its axles over the coupled switches 36/48.

The investigation report was concluded on the 21st July 2017.

Direct cause:

The locomotive EA 650 passed the route signal YIIIP on stop position, followed by it passing over the switch no.36, that was in operation process from the position „+” on the position „-”.

Contributing factors:

- a failure in the acceptance and stabling of the train no.17986, light locomotive EA 650, on an open reception track of the railway station Suceava, through the incomplete making of the entry route, before to start the shunting for coupling a locomotive at the passenger rake of wagons IR no.1765, stopped on the line II;
- decision of the movements inspector and the acceptance of the driver to pass from the running activity to the shunting one;
- the driver did not pay attention to the position of the light shunting signal M20.

Underlying causes:

- infringement of the provisions from „*Instructions for the activity of the locomotive crew no.201/2007*” art.100 paragraph (1) and from „*Regulations for the train running and shunting of the railway vehicles - no. 005*” art.170 about the stabling of the train in the railway station between the shunting limit signal from the reception line;
- infringement of the provisions from „*Instructions for the activity of the locomotive crew no.201/2007* art.127 paragraph (1) letter a) about careful tracking of the positions of the fixed and mobile signals;
- infringement of the provisions from „*Signaling regulations – no.004*” art.21 and art.22 „*Picture 26. STOP without passing the signal on stop position!*” about the compliance with the positions of the light signals.

Root causes:

None.

The trains no.17986 and no.17989 ran between the railway stations Suceava Nord and Suceava, without written disposal given by the operator of Traffic controller for the putting into running and without running order drafted by the movements inspector, infringing in this way the provisions from „Regulations for the train running and railway vehicle shunting - no. 005”.

Safety recommendations:

Taking into account the causes and factors generating the railway incident, the investigation commission recommends ASFR make sure that both the railway undertaking and the infrastructure manager take the measures necessary for keeping under control the risks generated by the infringement of the provisions for the train running.

3.4.44 The railway accident happened on the 28th March 2017, at 21:05 o'clock, in the railway county Craiova, track section Rosiori Nord - Videle, in the railway station Ciolpani, line 4, in the running of the freight train no.30559-2 (got by the railway freight undertaking Deutsche Bahn Cargo România) consisted in 30 wagons loaded with crops, consisted in the derailment of the 2nd bogie from the 3rd wagon.

The investigation report was concluded on the 13th December 2017.

Direct cause:

The direct cause of the accident is the fall between the rails of the right wheels from the second bogie of the third train wagon, on the line 4 for reception-dispatching, in the railway station Ciolpani. It happened because the increase of the track gauge over the accepted tolerances, following the lateral movement of the rail from the outside track of the curve under the action of the dynamic forces transmitted to the track by the rolling stock in running.

Contributing factors:

- keeping in operation of unsuitable wooden sleepers in the curve, after the switch no. 10, their condition leading to the decrease of the fastening system effectiveness and allowing the displacement to the outside of the track of the ensemble rail – metallic plate, under the dynamic forces of the rolling stock;
- supply with insufficient quantities of normal wooden sleepers for the performance of line maintenance and repair in the railway station Ciolpani;
- lack of the polyamide lining at the centre casting of the bogie II (the second bogie in the train running direction) from the wagon no. 33530823183-6, it leading to the increased rigidity of the ensemble bogie – wagon body, generating the increase of the lateral guiding force and implicitly to the decrease of the curve negotiation.

Underlying causes

- infringement of the provisions of 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-acceptance of unsuitable neighbour wooden sleepers in the track;
- infringement of the provisions from point.2.4.4., letter h) from Railway technical norm "Railway vehicles. Technical provisions for the repair of bogie frames that equipped the wagons and coaches no. 81-005:2006" concerning the non-acceptance in operation of polyamide linings between the centre castings of the wagon with the thick under 6mm.

Root cause

Non-application of all 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 maintenance process” (including the annexes), part of the safety management system of the railway public infrastructure manager CNCF „CFR” SA, concerning the coordination of the line maintenance.

Additional remarks

During the investigation, some problems were identified, they having no relevance on the accident causes:

- during the quarterly safety traffic analysis, made in the track section, the railway county Craiova has not, more often, appointed any representative with decision powers, who be notified, for settlement, about the traffic safety problems appeared in the territorial sub-units. Even more, the minutes concluded following those analysis are not sent to the management of the railway county Craiova;
- the finding notes, drafted at the hierarchical controls at the line districts L, do not achieve the purpose, the measures established following those controls are more often not implemented in the sub-unit. The notes drafted are not also submitted to the management of the railway county Craiova

Safety recommendations

The derailment of the wagon no. 33530823183-6, the 3rd of the freight train no.30559-2 happened because the unsuitable maintenance in the curve after the switch no. 10, with access to the line 4 of the railway station Ciolpani and following the increase of the rigidity of the ensemble bogie – wagon body, with consequences for the curve negotiation.

During the investigation, the investigation commission found out that the management of the infrastructure manager, at its central and county level, identified but did not managed the risks generated by the non-performance of line maintenance, in order to dispose, consequently, viable solutions and measures, for the control of the derailment hazards.

Thus, the public infrastructure manager, if it had applied the own procedures of the safety management system, completely, as well as the provisions of the practice codes, part of the Safety Management System SMS, it could keep the technical parameters of the track geometry between the tolerances imposed by the railway safety and to prevent the occurrence of this accident.

The commission, also found out that the top management of the railway undertaking did not identify and manage the risks generated by the lack/deterioration in operation of the polyamide linings between the centre castings of the wagon, leading to the unsuitable curve negotiation, so it could not take the measures for the control of these risks.

Taking into account the presented issues, the investigation commission recommend Romanian Railway Safety Authority ASFR:

1. to ask railway public infrastructure manager:
 - review "Own register of dangers";
 - effective management of the risks generated by the non-performance of the line maintenance, re-assessing the measures for those risk control.
2. to ask the railway undertaking to review its safety management system identifying and managing all the relevant risks generated by the operation.

3.4.45 The railway incident happened on the 19th April 2017, at 11:25 o'clock, in the railway county Galați, track section Buzău – Adjud, electrified double-track line, in the railway station Adjud, when one found, following a state inspection, carried out by the staff of State Railway Inspectorate Galați, that the braked weight percentage was not ensured for keeping stopped the train no.50458, got by the railway undertaking „UNICOM TRANZIT” SA.

The investigation report was concluded on the 11th May 2017.

Direct cause:

The direct cause of the railway incident is in the locomotive EA 843 there was no drag shoe necessary to ensure the braked weight percentage for keeping stopped the train no. 50458.

Contributing factors:

The factors that influenced the occurrence of the railway incident was the driver and the driver's assistant did not pay attention to the assimilation and meeting with the traffic safety conditions, sent by the movements inspector through „Running order series CFR no.659384”, where there was stipulated that in order to ensure the braked weight percentage for keeping stopped the train there are necessary 8 drag shoes.

Underlying causes:

Infringement of the provisions of Art. 30. – (6) from the Regulations for Hauling and Braking no. 006 / 2005 that prohibits the train routing from the railway station along the route, where the forming was changed, if they have not ensured, at least, the braked weight percentages stipulated in the working timetables, along all train running distance.

Root causes:

The root cause of the railway incident was the lack of a procedure for the endowment of the locomotive with drag shoes necessary to ensure the braked weight percentage, for keeping stopped the train, part of the Safety Management System.

Additional remarks:

During the investigation, one found out that some provisions from the instructions and regulations were infringed, these being without relevance for the conclusions and causes, as follows:

- infringement of the provisions from Instructions for the activity of the locomotive crew no. 201/2007 by the crew of the train 50458. Taking into account the technical condition of the locomotive, according to the records from the on-board sheet, the driver had to notify the movements inspector from the railway station Suceava and the management of SC UNICOM TRANZIT SA, because the locomotive was not suitable for the train hauling.
- infringement of the provisions from Regulations for hauling and braking no. 006/2005 by the crew of the train 50458. Before the routing of the train from the railway station Suceava, the continuity brake test was not performed in accordance with the instruction provisions. The driver's assistant had no hammer for inspection and the manometer existing in the locomotive was out of service (according to the records from the on-board sheet).

Measures taken

After the staff of the Railway State Inspectorate Galati found the railway incident, the train 50458 was kept in the railway station Adjud up to the arrival of the investigation commission.

The condition of the involved staff was checked.

The information was gathered and copies of the documents necessary for investigation were made.

The external station movements inspector from the railway station Adjud calculated again the braked weight necessary for keeping stopped the train, for its running between Adjud - Constanța Ferry Boat, corresponding to the braked weight percentage of 8%, establishing the need of 5 drag shoes.

The locomotive EA 843 was provided with 5 drag shoes.

The locomotive EA 843 was put in service and one performed working tests with the equipment for the control of the train speed (INDUSI).

The train 50458 was dispatched from the railway station Adjud at 19:41 o'clock, in safety conditions. SC UNICOM TRANZIT SA issued on the 25th April 2017 the Decision no.41 for the managing of the drag shoes existing in the locomotives, in order to ensure the braked weight percentage for keeping stopped the trains.

Safety recommendations:

None.

- 3.4.46 The railway incident happened on the 23rd April 2017 and found out on the 11th May 2017, at 15:00 o'clock, in the railway county București, track section București – Videle (electrified double-track line, on the track I, between Grădinari – Chiajna, according to the notification of DB Cargo Romania SA, about the non-compliance with the speed restriction of 30km/h between km.21+900 and km. 20+400, according to the provisions of Sheet for the Speed Restriction Notification - BAR, by the driver of the train no.30602, got by the railway undertaking DB Cargo Romania SA.

The investigation report was concluded on the 8th June 2017.

Direct cause:

The direct cause of the railway incident was a human mistake, that is the train crew did not pay attention, it leading to the exceeding of the maximum speed over the the speed restriction of 30 km/h stipulated in B.A.R.

Contributing factors:

None.

Underlying causes:

The locomotive crew did not meet with the provisions from the Instructions for the activity of the locomotive crew no. 201, art. 125, paragraphs (3) and (4) for the compliance with the provisions written down in B.A.R. and the adjustment of train speed so it be lower than the ordered one.

The locomotive crew did not comply with the provisions from Instructions for the activity of the locomotive crew no. 201, art. 127, paragraph (1), letter a) for tracking carefully the indicators.

Root causes:

None.

Other findings

The locomotive crew of the freight train on duty, after taking out of service the equipments INDUSI and DSV did not meet with the next provisions:

- recording in the locomotive notebook, according to art.9, letter h from the Instructions for the activity of the locomotive crew no. 201/2007;
- drafting of the event report in order to inform the company management , according to art.9, letter i from Instructions for the activity of the locomotive crew no. 201/2007;
- drafting of the notification note for the information of the movements inspector , according to the Annex 2, art.6.(2) from Instructions for the activity of the locomotive crew no. 201/2007.

Safety recommendations:

None.

3.4.47 The railway incident happened on the 16th June 2017, in the railway county Iași, in the railway station Dornești, on the branch line carrying feeder traffic to LFI EGGER, consisted in the derailment of 6 wagons at the shunting through banking of a rake of wagons on broad gauge track.

The investigation report was concluded on the 15th November 2017.

The investigation report was returned to the involved parts because following the analysis of this file, submitted to AGIFER for the divergence settlement, one found out that it does not contain documents that highlight the physic-mechanical characteristics and the structure of the material, determined following a technical expertise that had to be performed on samples taken from the rails that broke during the the incident.

Direct cause:

None.

Contributing factors:

None.

Underlying causes:

None.

Root causes

None.

Safety recommendations:

None.

3.4.48 The railway incident happened on the 3rd November 2017, at 05:24 o'clock, in the activity area of SC METROREX SA București, track section Preciziei–Anghel Saligny M3 (electrified double-track line), between the stations Politehnica and Eroilor, consisted in the hit of the train 39 REM 1110-2110 by a metallic construction for the collection of infiltration water.

The investigation report was concluded on the 13th November 2017.

Direct cause:

The direct cause of the incident was the passenger train no. 3901 ran with the pantograph half-lifted.

Contributing factors:

None.

Underlying causes:

Infringement of the provisions of “Guide for operative intervention at the train type BM”, chapter II, point 4, concerning the way to do at the appearance of the message “Pantograph position down non-confirmed” at TEM 2110 from the train composition.

Infringement of the Instructions for the metro traction staff no. 201M/2011, art. 16, letter h, concerning the obligation to inform the traffic/movement operator through the radio-communication device at the appearance of a failure in the traffic.

Root causes:

None.

Safety recommendations:

There was no safety recommendations because in the „Guide for the operative intervention *at the trains type BM* ” there is a procedure for the working way in such cases.

3.5 Accidents and incidents investigated in the last 5 years**Investigations performed between 2013-2017:**

| Investigated accidents ⁽¹⁾ | | 2013 | 2014 | 2015 | 2016 | 2017 | TOTAL |
|---------------------------------------|---|-----------|-----------|-----------|-----------|------------|-------|
| Accidents (Art.19, 1 + 2) | Train collisions | - | 1 | 1 | 1 | - | 3 |
| | Collisions between trains and obstacles | - | - | - | - | - | - |
| | Train derailments | 18 | 16 | 16 | 17 | 26 | 93 |
| | Level crossing accidents | - | 1 | 1 | - | - | 2 |
| | Person accidents generated by the rolling stock in motion | - | - | - | - | - | - |
| | Rolling stock fires | 4 | 1 | 3 | 5 | 5 | 18 |
| | Accidents involving dangerous goods | - | - | - | - | - | - |
| Other accidents (Art.21.6) | Train collisions | - | - | - | - | - | - |
| | 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 | - | - | - | - | - | - |
| Incidents | 17 | 20 | 26 | 14 | 17 | 94 | |
| TOTAL | 39 | 39 | 47 | 37 | 48 | 210 | |

⁽¹⁾ one took into account the year of the investigation ending;

⁽²⁾ one ended also a failure of a interoperability constituent, that is not included in the total number of incident ended in 2012.

4 RECOMMENDATIONS

4.1 Brief revision and presentation of the safety recommendations issued in 2017

Through the issued recommendations, Romanian Railway Investigation Agency aimed to improve the railway safety and to prevent the accidents.

| No | Involved train/ rolling stock | | Site of the railway event | | | Date of the report ending | Type of railway event | | |
|----|----------------------------------|--|---------------------------|--|-------|---------------------------------|--------------------------|---|--|
| | No. of train | Type of train | Occurrence site | Occurrence date | Hour | | | | |
| 1. | 42619 | freight | Gâlgău | 15.04.2016 | 05:09 | 16.01.2017 | accident | Derailment of a wagon bogie | |
| | | In the running of the the freight train no. 42619 (got by the railway undertaking SNTFM „CFR Marfă” SA), in the railway county Cluj, track section Dej Călători - Jibou (non-electrified double-track line), at the passing through the railway station Gâlgău, the first axle from the 25 th wagon derailed, in the running direction, the wagon being loaded with empty containers | | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority shall ask SNTFM „CFR Marfă” SA, as railway freight undertaking, to re-assess its measures for the prevention, keeping under control and decrease of the risks associated to the activity of technical inspection and maintenance of wagons in operation. | | | | | |
| | | Recomandation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that accident | | | | | |
| 2. | 4206-1 | freight | Șintereag | 18.02.2016 | 13:12 | 09.02.2017 | accident | Derailment of the first axle of a wagon | |
| | | In the railway county Cluj, track section Măgheruș Șieu – Beclean pe Someș (electrified single-track line), between the exit signal XI and the switch no. 4 from the railway station Șintereag, in the running of the passenger train regio no.4206-1 (got by the railway undertaking SC SNTFC „CFR Călători” SA) the first axle from the hauling locomotive EA 670, in the running direction, derailed. | | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority shall ask public railway infrastructure manager CNCF ”CFR” SA that, in the infrastructure maintenance, identify and keep permanently under control the risk associated to the danger generated by the lack of materials necessary to perform the railway infrastructure maintenance. | | | | | |
| | | Recomandation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that accident | | | | | |
| 3. | 33304 | freight | Timișu de Sus-Predeal | 08.05.2016 | 22:48 | 03.05.2017 | accident | Fire in the locomotive type EA | |

| | | | | | | | | |
|----|--------|--|----------------|---|-------|------------|----------|---|
| | | In the railway county Brasov, track section Braşov - Ploieşti Vest (electrified double-track line), between the railway stations Predeal and Timișu de Sus, km 148+125, on the track I, in the running of the freight train no.33304, got by the railway undertaking SNTFM „CFR Marfă” SA), a fire burst into the hauling locomotive EA 852. | | | | | | |
| | | Issued recommendations | 2 | Romanian Railway Safety Authority - ASFR shall ask the railway undertaking to revise its safety management system, drafting some procedures or instructions in accordance with the national and European norms in force for keeping under control the risks associated to the railway operations and compliance with these. | | | | |
| | | Recomandation in implementation process (open) | 2 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of those two safety recommendations issued following the investigation of that accident | | | | |
| | | passenger | Hârșești-Recea | 02.10.2016 | 09:40 | 23.05.2017 | incident | Hit of the equipments by the parts of the rolling stock |
| 4. | 9401-2 | In the railway county Craiova, between the railway stations Hârșești and Recea, 14 track magnets were hit by the locomotive DA 1191, got by the railway undertaking SNTFC „CFR Călători” SA, hauling the passenger train Regio no.9401-2. | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority shall ask SNTFC “CFR Călători” SA that, as railway undertaking, in the safety management process, re-analyze the maintenance process of the locomotives and establish the safety measures that have to be implemented in order to be sure that within this process all national safety norms, including the railway norm NF 67-006:2011 "Railway vehicles” are met. | | | | |
| | | Recomandation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that incident | | | | |
| 5. | 97559 | Freight | Balota | 06.10.2016 | 09:07 | 23.05.2017 | incident | Hit of the equipments by parts of the rolling stock |
| | | In the railway county Craiova, in the railway station Balota, the locomotive EA 566, being a dead one within the freight train no. 97559, got by the railway undertaking SNTFM „CFR Marfă” SA, hit a track magnet | | | | | | |

| | | | | | | | | |
|----|------|--|-------------|--|-------|------------|----------|----------------------------------|
| | | Issued recommendations | 1 | Romanian Railway Safety Authority shall ask SNTFM „CFR Marfă” SA, together the Company for the Locomotive and Vehicle Maintenance and Repairs – CFR IRLU SA, to add at the documentation for the inspections and repairs performed at the electric locomotives of 5100 KW clear provisions for the checking and then repair of the threaded cases, when these are not suitable from the supports of the primary suspension within the important repairs type RR and RG. | | | | |
| | | Recommendation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that incident | | | | |
| 6. | 3536 | passenger | Cața-Rupea | 14.06.2016 | 16:45 | 25.05.2017 | accident | Fire into the locomotive type EA |
| | | In the railway county Brasov, track section Braşov - Sighișoara (electrified double-track line), between the railway stations Cața and Rupea, a fire burst into the locomotive EA 557, being a dead one in the passenger train Regio no.3536 (got by the railway undertaking SNTFC „CFR Călători” SA). | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority – ASFR ask railway passenger undertaking SNTFC „CFR Călători” SA the revision of the operational procedures „Management of the risks associated to the railway safety” and „Planning of the inspections and repairs at the locomotives, multiple units and electrical multiple units got by SNTFC „CFR Călători””, so these ensure the identification of risks associated to the railway safety, as well as that the maintenance and operation of the locomotives are made in accordance with the specific legislation. | | | | |
| | | Recommendation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that accident | | | | |
| 7. | | passenger | Buzău-Boboc | 05.08.2016 | 17:22 | 14.07.2017 | accident | Fire into the locomotive type EA |
| | | In the railway county Galați, track section Buzău - Mărășești (electrified double-track line), between the railway stations Buzău and Boboc, on the track II, km 135+680, in the running of the passenger train no.5110(got by SNTFC „CFR Călători” SA) a fire burst into the hauling locomotive EA 818 | | | | | | |
| | | Issued recommendations | 6 | 1.During the controls and state inspections, Romanian Railway Safety Authority - ASFR ensure that the railway undertakings keep under control the risks of fire appearance in the rolling stock, generated by the non-performance of the planned maintenance. 2.Romanian Railway Safety Authority - ASFR ask the railway undertaking SNTFC „CFR Călători” SA to review the Sheet for the identification of dangers/assessment of the generated risks Code: F-PO-0-8.5.3-05-03 , so that the danger „Non-meeting with the cycle of inspections and repairs of the rolling stock” the generated risk „Fires in the rolling stock ” be identified; | | | | |

| | | | | | | | | |
|----|-------|--|---------------------|--|-------|------------|----------|--|
| | | | | <p>3. Romanian Railway Safety Authority - ASFR ask the railway undertaking SNTFC „CFR Călători” SA to review the operational procedure PO-07.1-14 „Planning of the inspections and repairs for locomotives, diesel and electric multiple-units got by SNTFC “CFR Călători” SA”, so that it be completed with concrete provisions concerning the measures that had to be established if the rolling stock reaches the norm of time/km for the performance of the planned repairs;</p> <p>4 Romanian Railway Safety Authority - ASFR analyze with the railway undertakings the opportunity to provide the motorized rolling stock with some equipments for the detection of smoke emissions in the critical areas with potential of fire appearance.</p> <p>5. Romanian Railway Safety Authority - ASFR analyze with the railway undertakings the opportunity to replace the joint pipes (exit and suction) of the main transformer tank with the oil cooler, made of inflammable materials with pipes made from inflammable materials, in order to avoid leakage of a big quantity of oil in the locomotive oil, in case of their deterioration;</p> <p>6. Romanian Railway Safety Authority - ASFR analyze with the railway undertakings and with the management of the General Inspectorate for Emergency Situations, the intervention way of the firemen in case of fires in the rolling stock so that, for the consequence limitation, not use water as extinguish agent.</p> | | | | |
| | | Recomandation in implementation process (open) | 6 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of those six safety recommendations issued following the investigation of that accident. | | | | |
| 8. | 17986 | passenger | Suceava | 08.02.2017 | 17:15 | 21.07.2017 | accident | Derailment of all axles from a locomotive of a passenger train |
| | | In the railway station Suceava, the shunting signal M20 was passed on stop position, without the locomotive EA 650, got by the railway undertaking SNTFC „CFR Călători” SA, meet with the specific regulations, followed by the derailment of all its axles over the coupled switches 36/48. | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority – ASFR make sure that both the railway undertaking and the infrastructure manager take the measures necessary for keeping under control the risks generated by the infringement of the provisions for the train running | | | | |
| | | Recomandation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendations issued following the investigation of that accident. | | | | |
| 9. | 87232 | freight | Târnavele-Rădulești | 26.08.2016 | 15:45 | 24.07.2017 | accident | Fire into the locomotive type DA |

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| | | In the railway county București, track section Videle – Giurgiu Nord (non-electrified single-track line), km 54+400, between the railway stations Târnavele and Rădulești, a fire burst into the locomotive DA 614, running as train no.87232 (got by the railway freight undertaking SNTFM „CFR Marfă” SA). | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority – ASFR ask the railway freight undertaking SNTFM „CFR Marfă” SA to re-examine the safety management system, so it ensure the identification and keeping under control the risks associated to the railway safety. | | | | |
| | | Recomandation in implementation process | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that accident | | | | |
| 10. | 92310 | freight | Valea Albă | 02.08.2016 | 06:50 | 28.07.2017 | accident | Derailment of a locomotive type ED |
| | | In the railway county Craiova, track section Strehaia – Drobeta Turnu Severin (electrified single-track line), in the railway station Valea Albă, km 349+770, in the running of the freight train no.92310, got by the railway undertaking SNTFM „CFR Marfă” SA, the axle no. 6 (leading axle) from the locomotive ED 047 derailed (traction multiple). | | | | | | |
| | | Issued recommendations | 1 | Romania Railway Safety Authority - ASFR ask the railway undertaking SNTFM „CFR Marfă” SA the revision of the safety management system , so it ensure the identification and the keeping under control of the risks associated to the railway safety. | | | | |
| | | Recomandation in implementation process | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that accident | | | | |
| 11. | 93756-1 | freight | Gura Motrului | 02.09.2016 | 09:22 | 31.08.2017 | accident | The derailment of a locomotive type EA |
| | | In the railway county Craiova, track section Gura Motrului-Turceni, electrified single-track line, on the branch line R3, the axle no. 6, first in the running direction, from the locomotive EA 130, hauling the freight train no.93756-1, got by the railway undertaking SNTFM „CFR Marfă” SA, derailed. | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority - ASFR take care that both the railway undertaking and the infrastructure manager take the measures needed for the control of the risks generated by the infringement of the provisions for the repairs of the railway vehicles, respectively for the track maintenance. | | | | |
| | | Non-implemented recommendations (closed) | 1 | Romanian Railway Safety Authority, through the answer sent by the paper no.2310/1297/13.09.2017 informed, about the safety recommendations issued following the investigation of this railway accident, that it was analyzed and can not be taken into account for implementation. | | | | |
| 12. | 1642 | passenger | Bicsadu Oltului - Malnaș Băi | 02.10.2016 | 02:45 | 28.09.2017 | accident | Derailment of a locomotive type EA |

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| | | In the railway county Braşov, track section Braşov - Siculeni (electrified single-track line), between the railway stations Bicsadu Oltului and Malnaş Băi, km 54+100, in the running of the passenger train no.1642, got by the railway undertaking SNTFC „CFR Călători” SA, the first axle derailed in the running direction of the hauling locomotive EA no.91530400014-3. | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority -ASFR, together the railway undertakings, that keep the locomotives like those involved in the accident, shall analyze the opportunity that, at an interval of time or running, at this type of axle be made the ultrasonic control but in disassembled condition. | | | | |
| | | Non-implemented recommendations | 1 | Romanian Railway Safety Authority, through the answer sent by the paper no.2310/1456/17.10.2017 informed about the safety recommendations issued following the investigation of this railway accident that it was analyzed, measures to be taken were identified and they were to be implemented | | | | |
| 13. | 80394 | freight | Medgidia | 19.10.2016 | 22:25 | 09.10.2017 | accident | Derailement of a wagoni |
| | | In the railway county Constanţa, track section Romcim – Medgidia, in the railway station Medgidia, the first bogie, in the running direction, from the 6 th wagon of the freight train no.80394, got by the railway freight undertaking SC GRUP FERVIAR ROMÂN SA, derailed. | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority ask economic agents, manufacturing and using wooden impregnated sleepers, to reassess the control of the risks generated by the impregnation of the wooden sleepers. | | | | |
| | | Recommendation in implementation process | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendations issued following the investigation of that accident | | | | |
| 14. | 51720 | freight | Ditrău | 17.11.2016 | 13:25 | 09.11.2017 | accident | Derailement of four wagons |
| | | In the railway county Braşov, track section Siculeni - Deda (electrified single-track line), km 162+600, in the railway station Ditrău, in the running of the freight train no.51720, got by the railway undertaking SNTFM „CFR Marfă” SA, 4 wagons derailed (the 17 th , 18 th , 19 th , 20 th wagons in the running direction). | | | | | | |
| | | Issued recommendations | 2 | Romanian Railway Safety Authority ask public railway infrastructure manager to review the safety management system and make a risk analysis for the cases where on the public railway infrastructure there are performed maintenance works with companies authorised by AFER and authorized traffic safety staff. | | | | |
| | | | | Romanian Railway Safety Authority 2. ask public railway infrastructure manager to analyze the opportunity to update its applicable regulations for the line closing, so do not exist ambiguities in the appointment of the traffic safety responsible for each part of the work | | | | |
| | | Recommendation in implementation process | 2 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendations issued following the investigation of that accident | | | | |

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| | | passenger | Neptun | 29.11.2016 | 18:05 | 21.11.2017 | accident | Fire in a multiple unit |
| | | In the railway county Constanța, track section Constanța – Mangalia (non-electrified single-track line), on the entry path to the railway station Neptun, km 263+170, in the running of the passenger train regio no.8389 (got by the railway undertaking SNTFC „CFR Călători” SA), consisting in the multiple unit AM753, a fire burst into the multiple unit. | | | | | | |
| 15. | 8389 | Issued recommendations | 1 | Romanian Railway Safety Authority – ASFR to undertake the necessary actions so that in the process for the construction changes (modernizations) of some structural subsystems of the motorized rolling stock, such situations be removed through: -assimilation by the beneficiary and by AFER of the technical changes made by the supplier; -checking by the beneficiary and by AFER of the conformity of the manufactured product against the execution documentation; - specific measures identified by the beneficiary for keeping under control the possible risks generated by the operation of the rolling stock, following the constructive changes ,ade at the rolling stock. | | | | |
| | | Recomandation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that accident | | | | |
| | | freight | Bârsești | 29.11.2016 | 13:40 | 27.11.2017 | accident | Serious collision between two locomotives during the shunting |
| | | In the railway county Craiova, in the railway station Bârsești, at the shunting of the light locomotive EA 515 for its coupling at the locomotive EC 104 (both of them got by the railway undertaking SNTFM „CFR Marfă” SA),that was coupled at the freight train no. 81708-1, parked on the line no.5, a serious collision happened between those two locomotives Following the collision the driver of the locomotive EA 515 died, the driver of the locomotive EC 104 was seriously hurt and the next damages appeared: <ul style="list-style-type: none"> ▪ distruction of the body of the first wagon from the freight train no.81708-1; ▪ serious damage of those two locomotives an the derailment of the first bogie from the locomotive EC 104. | | | | | | |
| 16. | manevră | Issued recommendations | 4 | Romanian Railway Safety Authority – ASFR be sure that the railway critical products from the circuit for the command of the electric locomotive dimmer, shall be included in the class of risk 1A – railway products which failure leads to the loss of transport safety and security; Romanian Railway Safety Authority – ASFR be sure that until the implementation of the recommendation no. 1, the electric locomotives manufactured by SC ELECTROPOTERE SA, submitted to changes at the circuit for the command of the dimmer against the homologated one at the manufacturing, shall not be accepted in operation only after disposing ensuring measures necessary for the railway safety; | | | | |

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| | | | | Romanian Railway Safety Authority – ASFR be sure that the legislation for the homologation of the products and repair services shall be reviewed so it does not conflict European provisions concerning the certification of the entities responsible with the maintenance, other than the wagons | | | | |
| | | | | Romanian Railway Safety Authority – ASFR be sure that the theoretical training for unusual and dangerous situations is joined by practical training, in a simulator, so the human operator deals with some unusual situations in order to get skills for action appropriate. | | | | |
| | | Recomandation in implementation process (open) | 2 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendations issued following the investigation of that accident | | | | |
| | | freight | Ciolpani | 28.03.2016 | 21:05 | 13.12.2017 | accident | Derailment of a wagon |
| | | In the railway county Craiova, on the line 4 of the railway station Ciolpani, track section Rosiori Nord – Videle (electrified double-track line), in the running of the freight train no.30559-2, got by the railway freight undertaking Deutsche Bahn Cargo România, the second bogie of a wagon derailed, loaded with crops, being the 3rd wagon of the train. | | | | | | |
| 17. | 30559-2 | Issued recommendations | 2 | Romanian Railway Safety Authority – ASFR ask railway public infrastructure manager: -to review "Own register of dangers"; -effective management of the risks generated by the non-performance of the line maintenance, re-assessing the measures for those risk control | | | | |
| | | | | Romanian Railway Safety Authority – ASFR ask the railway undertaking to review its safety management system, identifying and managing all the relevant risks generated by the operation | | | | |
| | | Recomandation in implementation process (open) | 2 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendation issued following the investigation of that accident | | | | |
| | | passenger | Izvoru Oltului-Izvoru Mureşului | 31.12.2016 | 05:45 | 19.12.2017 | accident | Derailment of a trailer wagon from a electric train set |
| 18. | 4504 | In the railway county Braşov, line 400, track section Siculeni - Deda (electrified single-track line), between the railway stations Izvoru Oltului and Izvoru Mureşului, km 122+120, the first bogie from the trailer wagon RE 012 of the passenger train Regio nr.4504, consisting in two electric train sets RE 011 and RE 012 (got by the railway undertaking SNTFC „CFR” Călători) derailed. | | | | | | |
| | | Issued recommendations | 2 | In order to decrease the risk to keep in operation railway vehicles after reaching the time norms (days, months, years) or thenorms of run km for the planned repairs, the investigation commission recommends Romanian Railway Safety Authority – ASFR to ask railway undertaking the revision of its own safety management system, drafting some procedures whose provisions be put in conformity with the national an European norms in force. | | | | |

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| | | | | To decrease the risk so that the area of the central pin wagon body – carrying bogie not be lubricated for a long time, the investigation commission recommends Romanian Railway Safety Authority – ASFR to ask the economic operator Societatea de Reparații Locomotive „CFR-SCRL Brașov” SA the revision of the technical specification for the maintenance of the electric train sets type Z 6100 | | | | |
| | | Recomandation in implementation process (open) | 2 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendations issued following the investigation of that accident. | | | | |
| | | freight | Brașov Triaj | 01.01.2017 | 02:55 | 28.12.2017 | accident | Derailment of a locomotive type EA |
| 19. | 50480-1 | In the railway county Brașov in the railway station Brașov Triaj, at the stabling of the freight train no.50480-1 (got by the railway undertaking SC UNICOM TRANZIT SA), hauled by the locomotives EA 212 and EA 223 (a banking one), on the line no. 9, the first axle from the locomotive EA 223 derailed over the switch no. 47 . | | | | | | |
| | | Issued recommendations | 1 | Romanian Railway Safety Authority ask to the railway freight undertaking the revision of the safety management system, drafting some procedures for the performance of a risk analysis in accordance with the national and European norms in force for the control of the risks associated to the railway operations. | | | | |
| | | Recomandation in implementation process (open) | 1 | Up to the draft of this report, no answer was received from Romanian Railway Safety Authority concerning the stage and implementation way of the safety recommendations issued following the investigation of that accident. | | | | |

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

| Investigations ended in | Number of the issued recommendations | Number of the implemented recommendations | Number of the recommendations in implementation process | Number of the recommendations non-implemented | Number of the recommendations without answer |
|-------------------------|--------------------------------------|---|---|---|--|
| 2013 | 2 | 0 | 1 | 1 | 0 |
| 2014 | 17 | 6 | 6 | 4 | 1 |
| 2015 | 32 | 7 | 10 | 8 | 7 |
| 2016 | 27 | 0 | 0 | 19 | 8 |
| 2017 | 31 | 1 | 0 | 1 | 29 |
| TOTAL | 109 | 14 | 17 | 33 | 45 |

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