MINISTRY OF TRANSPORTS AND INFRASTRUCTURE
ROMANIAN RAILWAY AUTHORITY - AFER

ROMANIAN RAILWAY INVESTIGATING BODY

INVESTIGATING REPORT

on the non-conformity happened on the 18th of March 2010
between Banita and Merisor railway stations
consisting in the exceeding of the maximum accepted speed by the line in the running of the freight train no. 50503

Final edition
The 16th of August 2010

NOTICE

With reference to the railway incidents happened on the 18th of March 2010 in the Branch of the Railway County Timisoara, on the track section Petrosani – Subcetate (double electrified line), on the line I, between the railway stations Banita and Merisor, consisting in the exceeding of the maximum accepted speed by the line 40 km/h in the running of the freight train no. 50503 (belonging to SC UNIFERTRANS SA Bucuresti), taking into account the application of Romanian Railway Safety Authority no. 2120/192/12.05.2010, in accordance with the art. 49, paragraph (2), letter d) of the *Regulations for the investigation of the accidents and incidents, for the development and improvement of the safety on Romanian railway and subway network*, approved by Government Decision 117/2010, Romanian Railway Investigating Body performed an investigation.

Through the investigation one gathered and analyzed the information on the occurrence of this non-conformity, the conditions and causes were established and the investigation commission concluded that the exceeding of the maximum accepted speed by the line with 1 km/h can`t be defined as railway incident, as one stipulate at the art. 8, paragraph 1, point 9 of the *Regulations for the investigation of the accidents and incidents, for the development and improvement of the safety on Romanian railway and subway network*, approved by Government Decision 117/2010.

OIFR investigation did not aim to establish the guilty or the responsibility in this situation.

Taking into account the conclusion of the investigation commission, Romanian Railway Investigating Body considers ended the investigation of this non-conformity, defined firstly as incident.

The 16th of August 2010

Approved
Director
Dragoş FLOROIU

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

Chief Investigator
Sorin Constantinescu

This approval is part of the Report for the investigation of the non-conformity occurred on the 18th of March 2010 in the Branch of the Railway County Timisoara, between the railway stations

Banita and Merisor, consisting in the exceeding of the maximum accepted speed by the line, in the running of the freight train no. 50503.

CONTENT

I. PREAMBLE

I.1. Introduction

On the 18th of March 2010 in the Branch of the Railway County Timisoara, on the track section Petrosani – Subcetate (double electrified line), on the line I, between the railway stations Banita and Merisor, in the running of the freight train no. 50503 (belonging to SC UNIFERTRANS SA Bucuresti) happened the exceeding with +1km of the maximum accepted speed of 40 km/h.

The non-conformity was found out during the inquiry of the railway event occurred on the 18th of March 2010, consisting in the derailment of 6 wagons of the freight train no. 50503 (event included in the art. 14. group A, point 4 of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/14.03.2000), that is during the reading of the records of the installation for train speed measuring and recording (ITSMR) of the locomotive EA 531.

On the 31st of March 2010, the exceeding with +1 km/h of the maximum speed accepted by the line, 40 km/h, was notified and preliminary defined as very serious railway event, in accordance with the provisions of the art. 14, group A, point 9 of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/2000.

I.2. Investigation

Following the notification on the 31st of March 2010 and its definition according to the provisions of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/14.03.2000, for the inquiry of the railway event one appointed an inquiry commission, consisting in the representatives of the involved railway undertakings, respectively the representatives of the public railway infrastructure administrator, CNCF "CFR" SA, and the railway freight undertaking SC UNIFERTRANS SA Bucuresti.

During the inquiry appeared divergences between the members of the inquiry commission of the railway event, defined in accordance with the provisions of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/14.03.2000, that is the representative of SC UNIFERTRANS SA Bucuresti stated in the inquiry commission that "the exceeding of the speed with 1 km/h during 3 seconds, on 92 meters can`t be defined as railway event because it is defined as speed indication error and the speed record at ITSMR, according to the technical specification, drawn up by SOFTRONIC, ITSMR manufacturer".

In this situation, the representative of the Branch of the Railway County Timisoara, as president of the inquiry commission asked Romanian Railway Safety Authority, by act no. 4/1/3/549/08.04.2010 to end the inquiry, following the divergences between the commission members, enclosing the draft of the inquiry file, according to the provisions of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/2000. The director of Romanian Railway Safety Authority appointed an investigation commission, consisting in its, in order to end the investigation.

On the 12th of May 2010, according to the art. 49, paragraph (2), letter d) of the *Regulations for the investigation of the accidents and incidents, for the development and improvement of the safety on*

Romanian railway and subway network, approved by Government Decision 117/2010, Romanian Railway Safety Authority submitted an application (no. 2120/192/2010), enclosing the divergent investigation file, unfinished by Romanian Railway Safety Authority.

Romanian Railway Investigating Body, taking note of the application of Romanian Railway Safety Authority, according to the art. 49, paragraph (2), letter d) of the *Regulations for the investigation of the accidents and incidents, for the development and improvement of the safety on Romanian railway and subway network*, approved by Government Decision 117/2010 and taking into account that the presented event could be defined as incident in accordance with the provisions of the art. 8, paragraph 1, point 9 of the same law, Romanian Railway Investigating Body decided to start the investigation.

Through the Decision no. 20 from the 13th of May 2010, the director of Romanian Railway Investigating Body appointed the investigation commission consisting in:

- Eduard STOIAN – investigator in charge,
- Marian ZAMFIRACHE - investigator,
- Livius OLTENACU – investigator,
- Luca PAIS – investigator.

A. SUMMARY

A.1. Brief presentation

On the 18th of March 2010, 8,49 hour, on the track section Petrosani – Subcetate (double electrified line), on the line I, between the railway stations Banita and Merisor, the freight train no. 50241, in the timetable being freight train no. 50241, hauled by the locomotive EA 531, (belonging to SC UNIFERTRANS SA Bucuresti), at the departure from the railway station Banita recorded a speed of 41 km/h against the maximum speed accepted by the line, 40 km/h, and stipulated in the working table of the freight trains in the Branch of the Railway County Timisoara, edition 2009/2010, after 648 m from the place where the train was dispatched in the railway station Banita.

The place of the non-conformity is in the Branch of the Railway County Timisoara, on the line I, between the railway stations Banita and Merisor, the route configuration being with gradient of 17,9 ‰ from the railway station Banita to Merisor, in the running direction of the freight train no. 50503.

The freight train no. 50503, on the 18th of March 2010 consisted in 24 loaded wagons, 96 axles, gross tonnage 1893 t, nett tonnage 1306 t, automatic braked 947/1092 t, hand braked 189/249 t, length 345 m and hauled by electric locomotive EA 531 (belonging to SC UNIFERTRANS SA Bucuresti), run between Plopşoru-Episcopia Bihor.

A.2. Non-conformity causes.

A.2.1. Direct cause

Non-conformity occurred following the human mistake in the brake of the freight train no. 50503, by late operating the KD2 valve handle of the locomotive EA 531 for the service brake in order to decrease the train speed, without taking into account the time necessary for the operation of the automatic brake so the train speed does not exceed the maximum speed accepted by the line and that stipulated in the working timetable, it led to the exceeding of the maximum speed of 40 km/h, accepted by the line, with 1 km.

Contributory factors

Choice of the moment for the operation of the the KD2 valve handle of the locomotive EA 531 for the automatic brake of the train, led to a delaied brake, while the train was in the start-up period after his departure from the railway station and run on a track section with down-grade 17,9 ‰ from the railway station Banita to the railway station Merisor, in the running direction of the train 50503.

A.2.2. Underlying causes

None.

A.2.3. Root causes

None.

A.3. Severity level

ITSMR equipment, type IVMS-IB-IA-200-110/144V, series 2118/2008 fitted up on the locomotive EA 531 is manufactured by SC SOFTRONIC SRL Craiova.

In the reference document of the manufacturer (ST001/1999, edition 1/2009) concerning the errors in the indication and record of the speed is stipulated:

- error in the indication of the speed is between 0 ... +2% from the indication field, and the difference between the indicated speed, obtained for increasing values and that obtained for decreasing values, at the same values of the speed, it has not to exceed 2 km/h in the indication period of the equipment;
- the error in the record of the speed is maximum ±1% from the measured field.

The results of the reading of the speed recorder tape were written in the Minute no. TS1/665/2010, drawn up by the Depot Simeria from the Branch of the Railway County Timisoara, from SNTFM „Marfa" SA and in the Report for the reading of the tape, drawn up on the 19th of March 2010 by SC UNIFERTRANS SA Bucuresti.

According to the view of the diagram of the record ITSMR, to those written in the Minute for the reading of the records of the ITSMR equipment no. TS1/665/2010 and to the Reading report drawn up by SC UNIFETRANS SA Bucuresti, results that the driver of the freight train no. 50503 took measures lately for braking on a track section in down-grade without taking into account that the automatic brake became active in such way that the maximum speed accepted by the line and that stipulated in the working timetable be not exceeded.

The non-conformity consisting in the exceeding of the maxim speed accepted by the line with 1 km/h is included in the class of precision and in the tolerances of the locomotive equipment for the measurement of the speed, so it can not be defined as railway incident as one stipulates in the art. 8, paragraph 1, point 9 of the *Regulations for the investigation of the accidents and incidents, for the development and improvement of the safety on Romanian railway and subway network*, approved by Government Decision 117/2010.

A.4. Safety recommendations

None.

This report will be sent to CNCF „CFR" SA – administrator of public railway infrastructure, SC UNIFERTRANS SA Bucuresti - railway undertaking and to Romanian Railway Safety Authority.

B. INVESTIGATING REPORT

B.1. Description

The freight train no. 50503 from the 18th of March 2010 consisted in 24 loaded wagons, 96 axles, gross tonnage 1893 t, net tonnage 1306 t, automatic braked 947/1092 t, hand braked 189/249 t, length 345 m and hauled by electric locomotive EA 531 (belonging to SC UNIFERTRANS SA Bucuresti), run between Plopsoru and Episcopia Bihor.

The freight train no. 50503 from the 18th of March 2010 was dispatched at 3:33 hour from the railway station Plopşoru and run without stop up to the railway station Amaradia, where stopped from 4:25 hour to 7:47 hour, in order to clear an arrival line from the railway station Targu Jiu.

After the arrival at 5:00 hour, in the railway station Targu Jiu, there was added the banking locomotive EC 107 (belonging to SC UNIFERTRANS SA Bucuresti) and at 5:17 hour the train was dispatched from the railway station Targu Jiu and run between Targu Jiu and Banita, with stops in the railway stations Ecaterina Teodoroiu, Parangul, Strambuta, Petrosani.

After the arrival of the freight train no. 50503 in the railway station Banita at 8:44:33 and after taking out of the banking locomotive EC 107, the train was dispatched at 8:48:06 hour from the line IV of the railway station Banita according to the „open" position of the exit signal X_{IV}, the exit route being made with access on the running line afferent to the line I between the railway stations Banita – Merisor.

On the 18th of March 2010, at 8:49 hour, on the track section Petrosani – Subcetate (double electrified line), on the line I between the railway stations Banita and Merisor, the freight train no. 50503, running in the timetable as train no. 50241, hauled by the locomotive EA 531, (belonging to SC UNIFERTRANS SA Bucuresti), at the departure from the railway station Banita had a speed of 41 km/h against the maximum speed accepted by the line 40 km/h and stipulated in the *Working timetable of the freight trains in the Branch of the Railway County Timisoara*, edition 2009/2010, after 648 m from the place where the train was dispatched in the railway station Banita.

This speed value of 41 km/h resulted from the reading of the ITSMR equipment records from the locomotive EA 531, belonging to SC INIFERTRANS SA Bucuresti, is writen both in the Minute no. TS1/665/2010, drawn up on the 22nd of March 2010 by the Depot Simeria and in the Report for the reading of the tape on the 19th of March 2010 by the representatives of SC UNIFERTRANS SA Bucuresti, as follows:

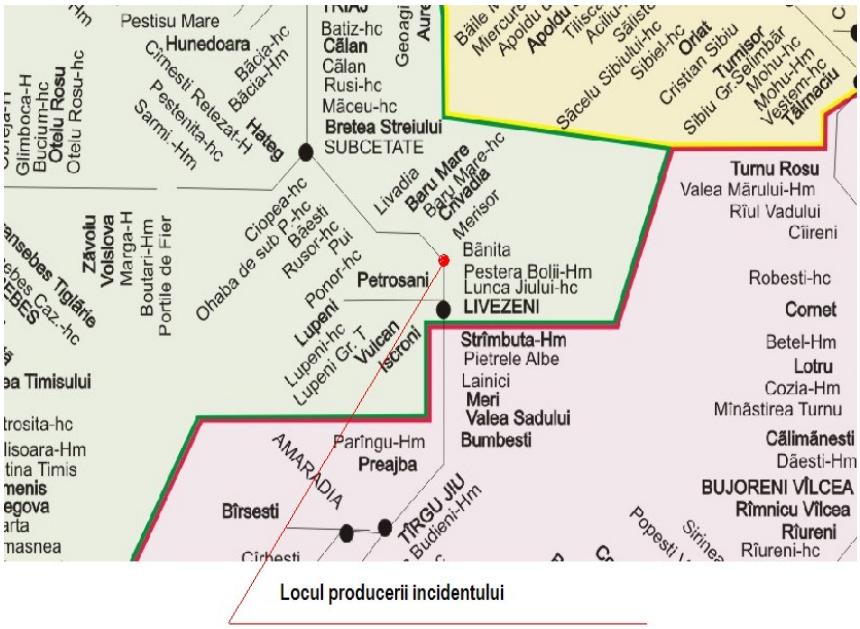
- in the reading report drawn up on the 19th of March 2010 by the representatives of SC UNIFERTRANS SA Bucuresti is mentioned that „the locomotive EA 531 leaves the railway station Banita at 8:48:06 hour and accelerated up to the speed of 41 km/h at 8:50:06 hour, running 649 m, then there was a track section of 354 m where the locomotive decrease the speed up to 33 km/h, at 8:50:39 hour;
- in the Minute no. TS1/665/2010, drawn up by the Depot Simeria is stipulated that „at 8:44:33 hour the train stopped in the railway station Banita up to 8:48:06 hour when the locomotive started to run, its speed increasing about invariably up to 41 km/h, on 648 m (at 8:50:06 hour), then on a distance of 412 m (hour 8:50:46) the train speed decreased at 31 km/h".

Between Banita and Merisor the maximum speed approved for the timetable 2009/2010 is 40 km/h, track DI, DII, passenger/freight, in accordance with the paper no. 21/1/3/762/2009 drawn up by Track Division Timisoara, speed stipulated in the *Working Timetable of the freight trains in the Branch of the Railway County Timisoara, valid starting with the 13th of December 2009*.

B.2. Circumstances

B.2.1. Involved parties

The place is situated in the Branch of the Railway County Timisoara, track section Livezeni – Subcetate, on the line I between the railway stations Banita and Merisor (km. 58+916), the track configuration being with a down-grade of 17,9‰ from the railway station Banita to the railway station Merisor, in the running direction of the freight train no. 50503.



The track section Livezeni-Subcetate is administrated by CNCF „CFR" SA Bucuresti and maintained by the employees of the Track District 6 Banita from the Track Section L9 Simeria, Branch of the Railway County Timisoara.

The electrification system (IFTE) is administrated by CNCF „CFR" SA and maintained by the emplyees of SC ELECTRIFICARE CFR SA – Railway County Timisoara.

The freight train no. 50503 consisted in 24 loaded wagons and was hauled by the electric locomotive EA 531, being to run between Plopsoru-Episcopia Bihor.

The locomotive EA 531 that hauled the freight train no. 50503 from the 18th of March 2010, belongs to SC UNIFERTRANS SA Bucuresti and it is maintained and inspected by its employees, and the repairs are performed by the economic agents authorized as railway suppliers.

B.2.2. Train composition and equipments

The freight train no. 50503 from the 18th of March 2010 consisted in 24 loaded wagons, 96 axles, gross tonnage 1893 t, nett tonnage 1306 t, automatic braked 947/1092 t, hand braked 189/249 t, length 345 m and hauled with electric locomotive EA 531 (belonging to SC UNIFERTRANS SA Bucuresti), run between Plopsoru and Episcopia Bihor.

The safety and vigilance device (DSV), the equipment for the punctual control of the speed and autostop (INDUSI) from the locomotive EA-531 were active and in operation, and the automatic brake and the direct brake were active.

The lever of the box of the equipment for the punctual control of the speed type INDUSI was found on "P" (persons) instead "M" (corresponding to the freight trains and those similary to them), different from the category of the hauled train, it being an infringement of the instruction provisions, but without direct connection with the cause of the deed occurrence.

The equipment for the indication and record of the installation for train speed measuring and recording, type IVMS from the locomotive EA 531 is type IVMS-IB-IA-200-110/144V, series 2118/2008, manufactured by SC SOFTRONIC SRL Craiova.

Front air valve position from the wagons, along the train, including that from the locomotive was open.

Levers of exchanger system "M (freight) – P (persons)" and exchanger "G (empty) – I (loaded)" was properly positioned, according to the loading condition and the running conditions of the train, and the percentage of the braking mass ensured.

B.2.3. Railway equipments

The running line, line I between the railway stations Bănița and Merişor was in down-grade with a gradient of 17,9‰ from the railway station Banita to the railway station Merisor, superstructure type 49, concrete sleepers T18, welded track.

The deed occurred in an area where the maximum speed of the trains stipulated in the working timetable was 40 km/h.

The railway stations Banita and Merisor are provided with CED equipments and the railway traffic is by automatic line block system.

B.2.4. Means of communications

The communication between the driver and movements inspectors was ensured by radios from the locomotive and route railway stations (the radiophone installation).

The railway communications equipments from the locomotive belongs to SC UNIFERTRANS SA Bucuresti and it is maintained by its employees.

B.2.5. Starting of the railway emergency plan

It is not necessary to start the railway emergency plan, the non-conformity being found during the investigation of the railway event occurred on the 18th of March 2010, consisting in the derailment of 6 wagons of the freight train no. 50503 (the event included in the art. 14, goup A, point 4 of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/14.03.2000), that is during the reading of the records of the ITSMR equipment of the locomotive EA 531.

The event of exceeding with +1 km/h of the maximum speed accepted by the line, 40 km/h was notified on the 31st of March 2010 and preliminary defined as very serious railway event, in accordance with the provisions of the art. 14, group A, point 9 of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/2000.

B.3. Consequences

B.3.1. Losses and injured people

None.

B.3.2. Material damages

None.

B.3.3. Consequences in the railway traffic

None.

B.4. External circumstances

On the 18th of March 2010, between the hours 8,30 and 9,00, the visibility at the deed place was good (about 2000 m), clouded sky, air temperature $+5^0$ C, with good lighting during the day.

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

B.5. Investigation

B.5.1. The summary of the involved staff testimonies

The locomotive staff was questionned on the railway event conditions, occurred on the 18th of March 2010, consisting in the derailment of 6 wagons of the freight train no. 50503 (event included in the art. 14, group A, point 4 of the Instructions for the prevention and inquiry of the railway accidents and events no. 003/2000, approved by Minister of Transports Order no. 210/14.03.2000).

Elements concerning the exceeding of the speed of 40 km/h, with +1km/h resulted from the the reading of the ITSMR equipment records from the locomotive EA 531, not being necessary to question the locomotive staff.

B.5.2. The safety management system

The safety management system was drawn up by SC UNIFERTRANS SA Bucuresti, and on the 27th of April 2008, Romanian Railway Safety Authority granted the safety certificate, part A, at the moment of the event, SC UNIFERTRANS SA Bucuresti having established its own safety management system.

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

In the investigation one took into account the next:

- the inquiry file no. 4/3/5/2010 of the railway event drawn up by Regional Safety Traffic Inspectorate of the Branch of the Railway County Timisoara - in draft situation because of SC UNIFERTRANS SA Bucuresti objections, it being member in the investigation commission;
- the inquiry file 2103/1/2010 drawn up by Railway Safety Inspectorate Timisoara, following the request of the president of the investigation commision, through the paper 4/1/3/549/2010;
- the minutes of the reading of the ITSMR equipment records from the locomotive involved;
- documents relating to the locomotive on board records, supplied by the persons in charge with their maintenance;
- the results of the ITSMR equipment records, made soon after the deed at the locomotive EA 531;
- analysis and interpretation of the technical condition of the involved locomotive EA 531;

- Instructions for the locomotive staff activity – no. 201/2007, approved by Minister of Transports, Constructions and Tourism Order no. 2229 from the 23rd of November 2006;
- Regulations for hauling and braking – no. 006 approved by Minister of Transports, Constructions and Tourism no. 1815 from the 26th of October 2005;
- Instructions manual ITSMR – SC SOFTRONIC SRL Craiova/2002.

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

B.5.4.1. Data about the technical equipments

The traffic between the railway stations Banita – Merisor is by automatic line block system. The railway stations Banita and Merisor are endowed with CED equipments.

B.5.4.2. Data about the lines

In the area of the event, the line is double electrified, in down-grade with a gradient of 17,9‰ from the railway station Banita to the railway station Merisor (in the running direction of the freight train no. 50503).

The rail is type 49, with indirect fastening type K, on concrete sleepers T13, consisting in non welded track.

The trains speed on that track section is 40 km/h.

B.5.4.3. Data about the operation of the rolling stock and of its technical equipments

The locomotive EA 531 had equipment „INDUSI" in operation and sealed with the switching lever on „P (persons)" instead „M (freight)".

The safety and vigilence equipment in operation and sealed.

The ITSMR equipment sealed.

The braking equipment of the locomotive was in operation and sealed.

In the diagram of ITSMR equipment records view, whose results are written in the Minute for the reading of the records of the equipment ITSMR no. STI/665/2010 and in the Report for the tape reading (SC UNIFERTRANS SA) (parts of the investigation file drawn up by the investigation commission) is stipulated that the speed of the locomotive between Banita – Merisor was the highest, that is 41 km/h, at 649 km against the start point from the railway station Banita.

The measurements at the tyres of the locomotive EA 531 performed by the employees from SC "CFR SCRL" Brasov SA, on the 8th of January 2010 are written in the register for the record of the tyres measurements. From the analysis of the quotas measured at the tyre from the axles of the locomotives resulted that they are between the values from the Regulations for the Railway Technical Operation no. 002/2001, but in the records of the tyres measurements is not written the wheels diameter.

SC CFR SCRL Brasov SA did not intend that the staff appointed to introduce in the equipment ITSMR the real data resulted following the measurement of the wheel diameter of the locomotive, that is the real value of the wheel diameter (1241 mm), against the value of the maximum diameter of the wheel (1250 mm), that was introduced in the equipment ITSMR. According to the provisions

from the Instructions Manual IVMS/2002, setting interval of the equipment ITSMR in accordance with the wheel diameter has to be between 920 mm and 1250 mm.

During the investigation, one found out a series of problems, that did not lead to the non-conformity, as follows:

- the driver of the locomotive EA 531, hauled by the freight train no. 50503 (employee of the railway undertaking SC UNIFERTRANS SA Bucuresti) did not complied with the provisions of the art. 88, paragraph (5) from the Instructions for the activity of the locomotive staff no. 201/2007, respectively he did not perform the records of the data imposed by the specific requirements for the operation of the ITSMR equipment of the locomotive EA 531, that is in the equipment records was the freight train no. 50521 instead the freight train no. 50503.
- the driving staff of the locomotive EA 531, hauled by the freight train no. 50503 (employees of the railway undertaking SC UNIFERTRANS SA Bucuresti) did not complied with the provisions of the art. 88, paragraph (2), letter b) of the Instructions for the activity of the locomotive staff no. 201/2007, that is the equipment for the punctual control of the speed was not switch on the right position of the hauled train (on "M" for the freight train and those similar them), the lever of the INDUSI equipment box being operated on "P" corresponding to the passenger and freight trains that run with the maximum speed stipulated in the working timetable of 100 km/h.

B.5.5. Interface man – machine – organization

The direct cause of the non-conformity is based on a human mistake type sensory-motor, consisting in the late operation of the KD2 valve handle of the locomotive EA 531 for the service brake in order to decrease the train speed, without taking into account the time necessary so that the automatic brake operate, when the train was in the start period after the departure from the railway station and running on a track in down-grade with gradient 17,9‰ (in the running direction of the freight train no. 50503).

B.6. Analysis and conclusions

ITSMR equipment, type IVMS-IB-IA-200-110/144V, series 2118/2008 fitted up on the locomotive EA 531 is manufactured by SC SOFTRONIC SRL Craiova.

In the reference document of the manufacturer (ST001/1999, edition 1/2009) concerning the errors in the indication and record of the speed is stipulated:

- error in the indication of the speed is between 0 ... +2% from the indication field, and the difference between the indicated speed, obtained for increasing values and that obtained for decreasing values, at the same values of the speed, it has not to exceed 2 km/h in the indication period of the equipment;
- the error in the record of the speed is maximum ±1% from the measured field.

The results of the reading of the ITSMR equipment records were written in the Minute no. TS1/665/2010, drawn up by the Depot Simeria from the Branch of the Railway County Timisoara, from SNTFM „Marfa" SA and in the Report for the reading of the tape, drawn up on the 19th of March 2010 by SC UNIFERTRANS SA Bucuresti.

Following the checking performed on the 4th of May 2010 concerning the conformity of the speed record/indication by the ITSMR equipment fitted up on the locomotive EA 531 and its use by the indicator (both in digital and analogues mode), one did not found aut differences or deviations at the speeds of 25 km/h, 41 km/h and 90 km/h. The digital speed display is made with a resolution of 1 km/h and the indication of the speed on the display of the analogue instrument is made from 5 to

5 km/h. Following the and of the checking (performed in the presence of SC SOFTRONIC SA Craiova) there was drawn up the Minute no. 3C/1312/04.05.2010.

Taking into account that the real value of the wheel diameter (1241 mm) is smaller than the value of the maximum wheel diameter (1250 mm), introduced as reference element in the memory of the ITSMR equipment, results that the real speed of the locomotive was under that registered in the memory of the ITSMR equipment of the locomotive.

According to the view of the diagram of the ITSMR record, to those written in the Minute for the reading of the records of the equipment IVMS no. TS1/665/2010 and to the Reading report drawn up by SC UNIFETRANS SA Bucuresti, results that the driver of the freight train no. 50503 took measures lately for braking on a track section in down-grade without taking into account that the automatic brake became active in such way that the maximum speed accepted by the line and that stipulated in the working timetable be not exceeded.

Besides those above mentioned, results that **the exceeding of the maximum running speed accepted by the line with 1 km/h is included in the accuaracy class and the tolerances of the equipment for the speed measurement of the locomotive, so it could not be defined as railway incident according to the art 8, paragraph 1, point 9** of the *Regulations for the investigation of the accidents and incidents, for the development and improvement of the safety on Romanian railway and subway network*, approved by Government Decision no. 117/2010.

B.7. Non-conformity causes

B.7.1. Direct cause

Non-conformity occurred following the human mistake in the brake of the freight train no. 50503, by late operating the KD2 valve handle of the locomotive EA 531 for the service brake in order to decrease the train speed, without taking into account the time necessary for the operation of the automatic brake so the train speed does not exceed the maximum speed accepted by the line and that stipulated in the working timetable, it led to the exceeding of the maximum speed of 40 km/h, accepted by the line, with 1 km.

Contributory factors

Choice of the moment for the operation of the the KD2 valve handle of the locomotive EA 531 for the automatic brake of the train, led to a delaied brake, while the train was in the start-up period after his departure from the railway station and run on a track section with down-grade 17,9 ‰ from the railway station Banita to the railway station Merisor, in the running direction of the train 50503.

B.7.2. Underlying causes

None.

B.7.3. Root causes

None.

C. SAFETY RECOMMENDATIONS

None.

This report will be sent to CNCF „CFR" SA – administrator of public railway infrastructure, SC UNIFERTRANS SA Bucureşti - railway undertaking and to Romanian Railway Safety Authority.

Members of the investigation commission:

- Eduard STOIAN – investigator in charge
- Marian ZAMFIRACHE - investigator
- Livius OLTENACU – investigator
- Luca PAIS – investigator