



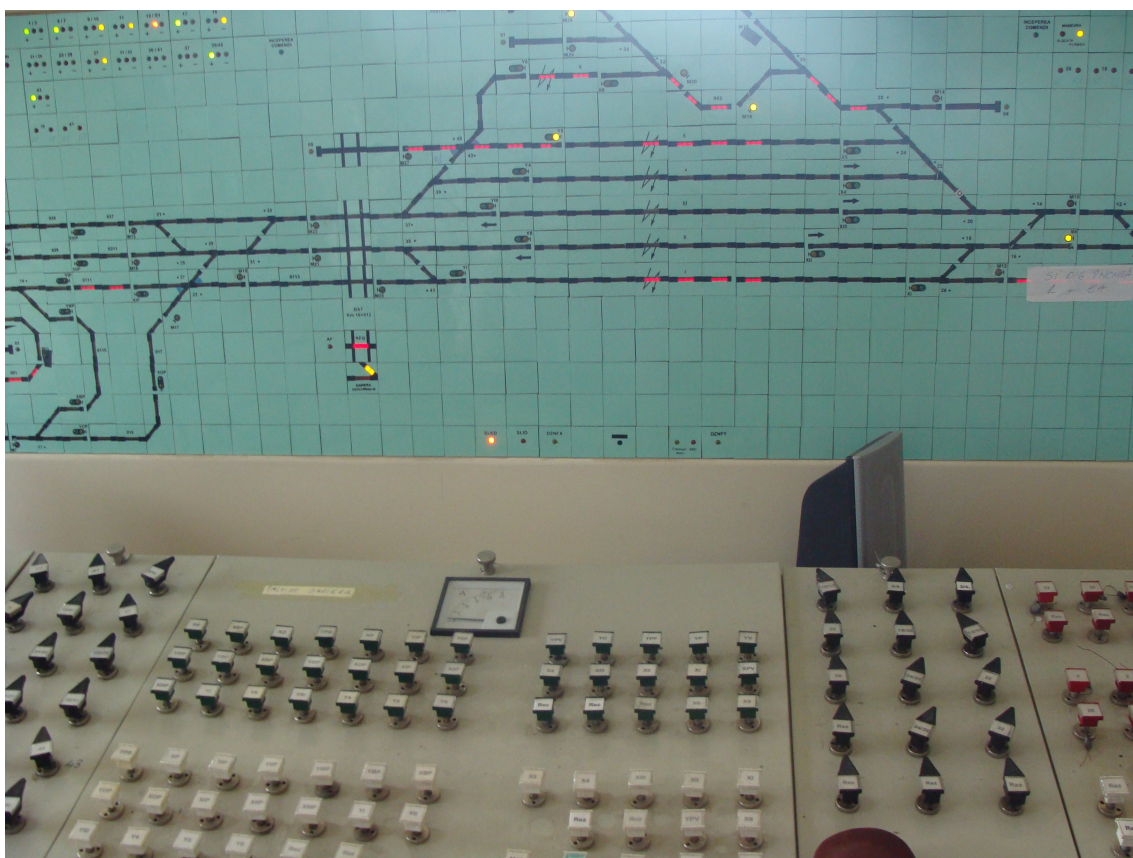
MINISTRY OF TRANSPORTS AND INFRASTRUCTURE  
ROMANIAN RAILWAY AUTHORITY - AFER

ROMANIAN RAILWAY INVESTIGATING BODY



## INVESTIGATING REPORT

on the incident happened  
in the railway station Pantelimon,  
on 05 December 2009



Final edition  
15.03.2010

## NOTICE

Concerning the railway **incident**, happened on the **05<sup>th</sup> of December 2009**, at **13:43**, on the Branch of Bucharest Railway County, in railway station CFR **Pantelimon**, by stopping the passenger train no. 8013 on the switch no. 37 which was in position with access to line 4, occupied by the passenger train no. 18207, Romanian Railway Investigating Body performed an investigation, according to the provisions of the Law 55/2006 on railway safety.

Through the performed investigation, the information concerning the occurrence of this incident were gathered and analyzed, the conditions were established and the causes determined.

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

Romanian Railway Investigating Body considers as necessary to take some corrective measures, in order to improve the railway safety and to prevent the accidents and incidents, and accordingly it made some recommendations on this report.

Bucharest, the 15<sup>th</sup> of March 2010

**I consider positive**

**Director,**  
Dragos FLOROIU

I ascertain the compliance with the legal provisions concerning the conduct of the investigation and the drawing up of this investigating report that I propose for approval

Chief Investigator  
Sorin CONSTANTINESCU

***This notice is part of the report for the investigation of the railway incident happened on the 05th of December 2009, at 13:43, on the Branch of Bucharest Railway County, in railway station Pantelimon, by stopping the passenger train no. 8013 on the switch no. 37 which was in position with access to line 4, occupied by the passenger train no. 18207.***

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**I. Preamble****I.1. Introduction**

Concerning the railway incident, happened on the 05<sup>th</sup> of December 2009, at 13:43, on the Branch of Bucharest Railway County, in the railway station Pantelimon, by stopping the passenger train no. 8013 on the switch no. 37 which was in position with access to line 4, occupied by the passenger train no. 18207, the Romanian Railway Investigating Body (OIFR) performed an investigation, according to the provisions of the Law 55/2006 on railway safety in order to prevent some incidents with similar causes, establishing the conditions, determining the causes.

The investigation of Romanian Railway Investigating Body does not aim to establish the guilty or the responsibility, its objective being the improvement of the railway safety and the prevention of the railway accidents and incidents.

**I.2. Investigation process**

On the 05<sup>th</sup> of December 2009, OIFR was notified by the Romanian Railway Safety Authority about the railway incident occurrence on the Branch of Bucharest Railway County. At the railway incident place, specialists within OIFR were displaced and found out that in railway station CFR Pantelimon, the passenger train no. 8013 stopped on the switch no. 37 which was in position with access to line 4, occupied by the passenger train no. 18207.

Also, specialists within the Romanian Railway Safety Authority were displaced, as well as representatives of the public railway infrastructure manager, including the representatives of the involved railway operator, respectively SNTFC „CFR Calatori” SA

Taking into account that the occurred event, respectively the reception in a station of a train on a occupied track, passing of the first axle on the switch, is associated with the operation of trains, it has affected the safe operation and it is ranked as railway incident, in accordance with article 19(2) of the Law 55/2006 concerning the railway safety, therefore OIFR director decided to perform an investigation.

Through the decision of OIFR director no. 15 from the 08<sup>th</sup> of December 2009, one established an investigation commission, consisting in:

- Constantinescu Sorin – investigator in charge;
- Olaru Mihai – investigator;
- Toader Doru Cătălin – investigator;
- Draghici Marin – investigator.

## **A. INCIDENT BRIEF PRESENTATION**

### **A.1 Brief presentation**

The passenger train no. 8013, consisting of 6 wagons, 24 axles, 272 tones, 175 meters, hauled with the GM 410-747-0 locomotive (belonging to Bucharest Calatori engine shed) was running between Bucharest Obor – Constanta.

On the 05th of December 2009, the passenger train no. 8013 left the railway station Bucharest Obor at 13:18, time schedule provided in the Passenger timetable, 2009/2010 edition.

From the railway station Bucharest Obor, the passenger train no. 8013 circulated to the railway station Pantelimon, under permissive colour-light signals.

Receiving the passenger train no. 8013, from the XOP route signal of the railway station Pantelimon to line 3 in the station, it was carried out in the basis of the reception order.

The engine driver of the passenger train no. 8013 stopped the train on the switch no. 37, because he noted that the route was to line 4, which was occupied by the passenger train no. 18207.

Following this accident it was not recorded any victims or injured people.

### **A.2. Direct causes, underlying causes and root causes**

#### **A.2.1. Direct causes**

The incident occurred as a result of incorrect performance of the entrance for the passenger train no. 8013 at line 4 occupied by the passenger train no. 18207 instead of line 3 free, and due to the emergency signal operation of the XOP signal from the railway station CFR Pantelimon without checking the line and the entrance.

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

1. When the railway incident occurred, the handling instruction of relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009, wasn't prepared, diffused and processed with the interested operating staff.
2. The operating staff from the railway station Pantelimon wasn't trained on how to work and wasn't authorised for the handling of relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009.

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

The lack of certification/granting of agreement of the relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009 and its acceptance into operation by the railway infrastructure manager representative without a prior authorization for operation.

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

According to the provisions of article 3, letter o of the Law no.55/2006 on the railway safety, the event is qualified as railway incident.

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

The recommendations are for solving the following aspects:

1. The public railway infrastructure manager will take all measures for application in the field for putting into operation of structural subsystems and interoperability constituents and certification/granting of agreement for critical railway products. This recommendation was issued also with the occasion of the railway incident investigation on 16<sup>th</sup> of December 2009 in the railway station Basarabi but no action was taken to implement the recommendation.
2. The public railway infrastructure manager will comply with the legislation for authorizing the staff with responsibilities in traffic safety that follows to carry out on own responsibility railway transport activities.

3. The identification by the public railway infrastructure manager in the control measures of:
  - interlocking systems not certificated / no agreement granted
  - the operation staff unauthorized for handling the installations (interlocking systems, telephone systems and energy supply systems), and application of legal provisions.

The present Investigating Report will be transmitted to the manager of the public railway infrastructure National Railway Company „CFR” S.A, SNTFC „CFR Calatori” SA, Romanian Railway Notified Body and to the Romanian Railway Safety Authority.

According to the provisions of the Law no.55/2006 on the railway safety, the Romanian Railway Safety Authority will survey the way of implementation of these recommendations.

## **B. INVESTIGATION REPORT**

### **B.1 Incident presentation**

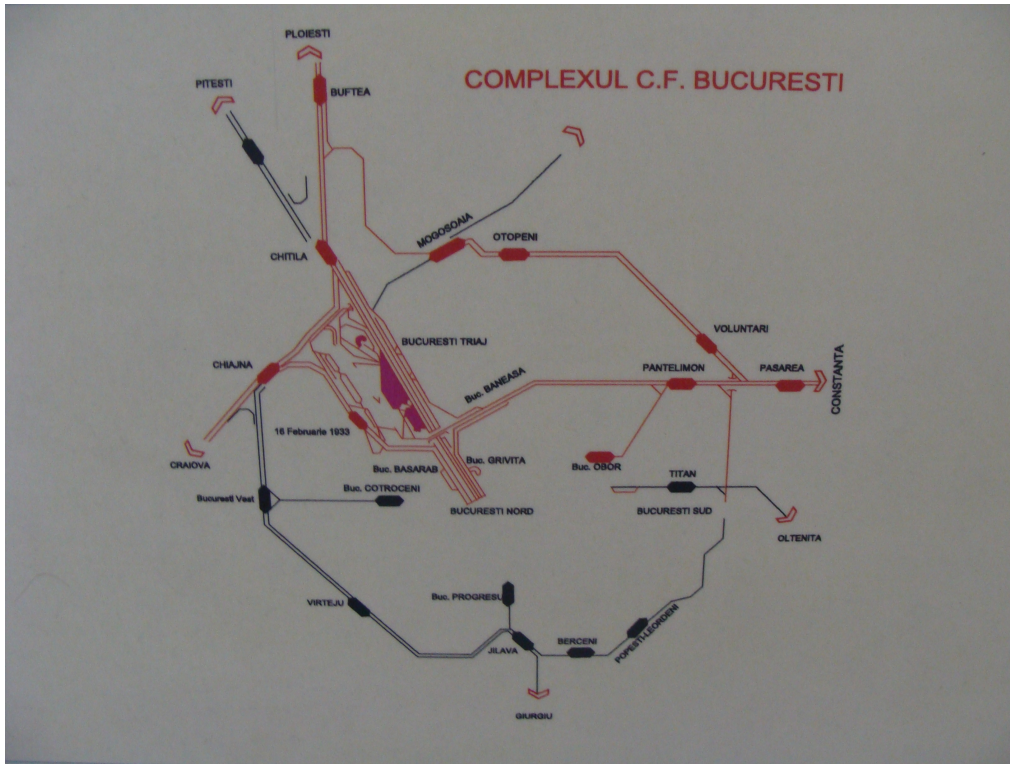
On 05<sup>th</sup> of December 2009, the passenger train no. 8013 left the railway station Bucharest Obor at 13:18, it stopped for 1 minute in Pantelimon Sud halt. According to the color-light signals, he run towards the railway station Pantelimon, where he passed the railway station XO entry signal, indicating „Free line with set speed! WARNING! The next signal orders the stop” (a light unit of yellow colour), and the XOP route signal indicating „Free line with a maximum speed of 20 km/h, with caution, until the next signal” (a light unit of white colour, blinking, to train).

After passing the railway station Pantelimon XOP route signal, the train covers a distance of about aproximatelly 462 meters, with maximum speed of 20 km/h, after which, at 13:37, it stopped on the switch no. 37, following the engine driver's observation that the train was operated towards line 4, occupied by the passenger train no. 18207.

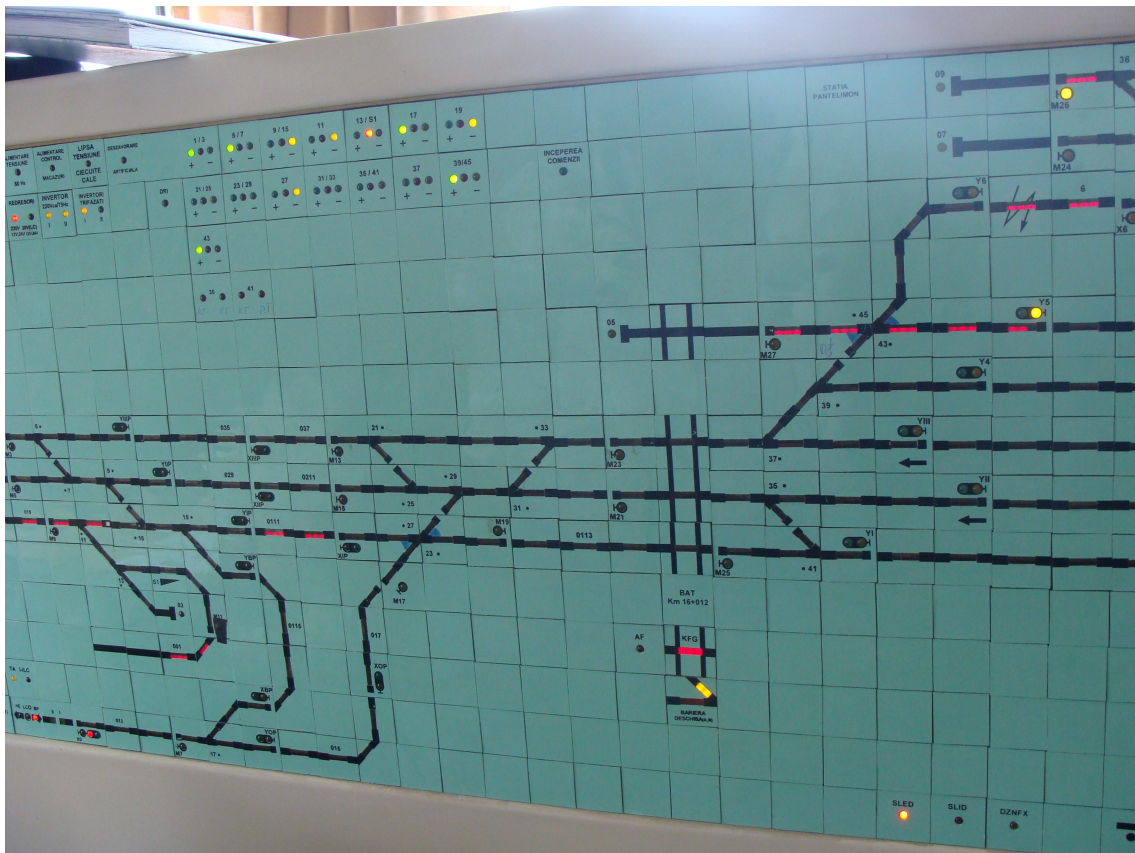
The place were the incident occured is located on the Branch of Bucharest Railway County, in railway station Pantelimon, in the switches area in the X end of the railway station.

The track route configuration is on the flat and in a straight line.





Picture 1 – Geographical location of the accident.



## Picture 2 – The X end of the railway station CFR Pantelimon

The passenger train no. 18207, was running between Bucharest North – Pantelimon, he left the railway station Bucharest Baneasa at 13:16 and arrived in the railway station Pantelimon at 13:26, being parked to line 4.

Following this accident it was not recorded any victims or injured people.

## **B.2 The background to the occurrence**

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

The place where the incident occurred, the railway station Pantelimon, is under CNCF „CFR” SA administration, the Branch of Bucharest Railway County.

The power and electric traction equipment (IFTE) is under the management of CNCF „CFR” SA and is maintained by the employees of SC ELECTRIFICARE CFR SA – București County.

The inquiry commission questioned the employees involved in the railway incident, respectively the movement inspector in the railway station Pantelimon, interlocking system electromechanic and interlocking system adjuster.

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

The passenger train no. 8013, consisting of 6 wagons, 24 axles, 272 tones, 175 meters, hauled with the GM 410-747-0 locomotive (belonging to Bucharest Calatori engine shed) was running between Bucharest Obor – Constanța.

The indication and speed record equipment (IVMS), the safety and automatic warning systems (DSV), the equipment for the punctual control of the speed and auto-stop (INDUSI) from the endowment of the traction locomotive of the train no. 8013, were active and operated in accordance with the instructions.

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

On 1st of December 2009, in the railway station Pantelimon, the railway incident place, works were performed at the Control-Command and Signalling subsystem (the equipment for safety, organization and movement of trains and shunting), by removing from operation of relay interlocking system type CR2 adapted for point machines type EM5 in A.C. and for point machines type SIEMENS S700K and the replacement with relay interlocking system with key button and vertical control panel. On the day of the railway incident this equipment was providing the safety requirements for the organization and railway movement only for lines III and 4.

- with arrivals - departures of trains in the Pasarea and Voluntari direction on running line II

- with arrivals - departures of trains in the Bucharest - Baneasa direction on running line II
- with arrivals - departures of trains in the Bucharest Obor direction.

#### **B.2.4 Communications facilities**

The communication between the engine driver and the movement inspectors, as well as, between the engine driver and the train crew was ensured by radiotelephonic equipment.

#### **B.2.5 Starting of the railway emergency plan**

As soon as the railway incident happened, it wasn't necessary to start the intervention plan in order to remove the damages and to restart the trains traffic, the railway incident being notified by the information flow stipulated in annex 2 from the Instructions for the prevention and inquiry of the railway incidents and events – no. 003.

Following the notification at the incident place presented the representatives of the National Railways Company „CFR” SA – railway infrastructure manager, SNTFC „CFR Calatori” SA – railway undertaking, and of Romanian Railway Safety Authority, of the Romanian Railway Investigating Body.

The restarting of the trains traffic wasn't necessary.

### **B.3 Accident consequences**

#### **B.3.1 Losses and casualties**

The railway incident did not generate losses and casualties.

#### **B.3.2 Material damages**

There were no material damages.

#### **B.3.3 Consequences of the railway incident on the railway traffic**

Following the railway incident, the next trains suffered delays:

- the passenger train no. 8013 +29 minutes
- the passenger train no. 18207 +28 minutes
- the passenger train no. 18208 +17 minutes

### **B.4 External circumstances**

On the 05th of December 2009, between 13:00 and 14:00, the visibility was good, and the temperature was about 10°C.

In the railway station Pantelimon, the line III was open, line 4 was occupied by the passenger train no. 18207. The lines I, II, 5, 6, 7, 8, 9 were closed for running and shunting.

In the railway incident area the line is in a straight line and on flat.

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

## **B.5 Investigation process**

### **B.5.1 Brief presentation of the involved staff testimonies**

From the statement of the **movement inspector** on duty **from the railway station Pantelimon** from the 05th of December 2009, one can underline:

- when he took his responsibilities he noticed that the barrier in the enclosure of the railway station (BAT km 16+012) wasn't working;
- the failure was removed by the „regional laboratory” and by SCB employees at around 10:30;
- at the performance of the order for the entry of the train no.18706-1, from Bucharest Obor, although one correctly performed the passing of the XOP signal, it wasn't on free position and on the illuminated track-diagram it wasn't indicated any interruption to train movement;
- the adjuster on duty went to the barrier and pull the lever, then the XOP signal changed to open position and on the illuminated track-diagram the signalling was appropriate;
- in general to perform an order, the interlocking system employees have recommended the movement inspectors to make the routs from the buttons (manually) following a centralized control;
- this approach was recommended because after putting in service of the equipment, the switches 31/33 that were conjugated, didn't operate in accordance with their position in the field; this was remedied on 01st of December 2009;
- after receiving the passenger train no. 18207 from the railway station Bucharest Baneasa on line 4, at 13:26, it should have received the passenger train no.8013 from Bucharest Obor on line III;
- the passenger train no.18207 was on entry route, it had perform the entry route for the passenger train no.8013 only until the XOP route signal;
- after the parking of the passenger train no.18207 at line 4, he operate the switch no.37 in plus position and the 31/33 conjugated switch in miuns position;
- he observed on the illuminated track-diagram that the green light turned on, right, from the switch no.37 indicating the plus position and at the conjugated switch 31/33 he observed the yellow light, left, indicating the minus position;
- he operated the two buttons of switch in middle (centralized control position);
- he performed the centralized route for the passenger train no.8013 from the XOP route signal at line III, by pushing the XOP button, then YIII, but he noticed that the XOP signal isn't in open position;
- he informed the interlocking system electromechanic on duty that again the XOP signal isn't in open position, and the electromechanic said „let's see”;

- he push the KSTX button to check the switches position from the route, the slot from the XOP signal has been lighting up to the switch no.37, on plus, and then again one performed a centralized route of XOP route signal at line III;
- after that the interlocking system electromechanic told him to accept the train with calling as not to delay the train;
- no one went on the field to check the position of the switch no.37;
- he broke the seal from the call signal then he informed the engine driver from the passenger train no. 8013 that the train enters the line III with call signal;
- after the passenger train no. 8013 passed the cross-over 31/33, the engine driver from the passenger train no. 8013 informed that he stopped the train in front of the switch no.37 that was with access to line 4 (on minus);
- after that the engine driver from the passenger train no. 8013 requested a running order so that he can run back the train until the XOP route signal;
- the interlocking system electromechanic on duty took the bag of tools and the crank handle and he went to the switch no. 37;
- after he completed the running order, he left to the field where he found that the switch no. 37 had access to line 4, not being ajared;
- when he return from the field, he noticed that the button of the switch no. 37 was in automatic position and in the cell of the switch no. 37 was no light on;
- he spin the lever of switch no. 37 to right (plus position) and the red lamp from the center of the switch no. 37 turned on; the bells didn't ring because they weren't into service;
- then he spin the switch lever to the middle and then to the left and the switch received control on minus;
- he performed centralized route from XOP to line III, the XOP signal turn to open position and he received the passenger train no. 8013 on line III;
- he dispatch the train no. 8013 from line III to Pasărea direction;
- he dispatch the train no. 18207-2 from line 4 to railway station Bucharest Obor;
- he perform passing route in Pasărea direction for the trains no.83533, 81747 and 681 that runs at block section;
- then, „he wanted to write down in the RRISC register the broken of the seal from the XOP call signal, but the register was taken by the electromechanic on duty, and he return the register at 15:50”;
- the incident approval was verbal to the RC operator at 14:02, after he dispatch the train no. 8013 and after he call the stationmaster to ask about the incident;
- it was the third shift on this equipment;
- the stationmaster and the movement inspectors from the railway station Pantelimon weren't instructed to operate on this relay interlocking system
- the stationmaster and the movement inspectors from the railway station Pantelimon weren't authorized to operate on this relay interlocking system
- There is no standing instruction for equipment operation in the railway station Pantelimon
- in case of interruption to train movement due to the lack of operation instructions he applied the general principles, but the signalings were different from the CR 3

equipment (previous classic) at which the bell was ringing and the switch spot twinkle in case of interruption to train movement;

- a copy of the operation instructions for the new relay interlocking system, unsigned, he saw it for the first time on 07<sup>th</sup> of December 2009, at the exit from the work shift, at the railway station Pantelimon station master.

From the statement of **the interlocking system electromechanic** on duty **from the railway station Pantelimon** from the 05th of December 2009, one can underline:

- he was noticed by the movement inspector on duty that the XOP signal isn't in open position although he repeated the command for several times;
- the movement inspector checked the route by pushing the KSTX button, but **he didn't observe** if the trace was lighted until the switch no.37 or line III;
- after the train no. 8013 stopped, he noticed that on the illuminated track-diagram all sections in the railway station were free except the ones from 21 to 33 and 37, and the barrier from the X end had control on closed position;
- the switch no. 37 wasn't signalling on the push-button interlocking frame;
- he went on the field and he found that the train was stopped on the heel of blade no. 37 and the switch was locked on minus position with access to line 4;
- after the train backing-into-siding operation he performed tests at the switch no. 37, together with the movement inspector and the switch was operating normally;
- during 1-5 of December 2010 there was no interruption to train movements at the switch no. 37;

From the statement of the **engine driver** of the GM 410-747-0 locomotive that hauled the passenger train no.8013 from the 05th of December 2009, one can underline:

- after stopping in Pantelimon Sud halt, the movement inspector told him through the radio station that the XOP route signal from the railway station Pantelimon indicates clear position to line III;
- after passing the XOP signal with clear position and entrance on the railway station switches one found out that the route was towards line 4 occupied by the train no.18207, he took measures to stop the train over the switch, before entry on line 4;
- after stopping, the movement inspector from the railway station Pantelimon asked him where he is and the engine driver told him that he is over the switches, before entering the busy line 4;
- at the movement inspector request to run back he asked for a running order;
- after 6-7 minutes he received the running order and then he ran back the train until the XOP signal;
- then he was accepted in the railway station with the XOP signal with permissive light on line 3 deflecting section.

From the statement of the **interlocking system adjuster** on duty **from the railway station Pantelimon** from the 05th of December 2009, one can underline:

- he didn't see anything because he was in the SCB office and he was eating.

### **B.5.2. Safety Management System**

When the railway incident took place, CNCF “CFR” SA didn’t establish its own safety management system. The safety management system was issued and transmitted to the Romanian Railway Safety Authority on December 21, 2009 when was granted the safety authorization part A.

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

At the railway incident investigation the followings were taken into account:

- the investigating file no. SC. 2/16 from 17<sup>th</sup> of December 2009 of the railway incident drawn up by the inquiry commission named according to the provisions of the Instructions for preventing and investigating the railway events and incidents no. 003/2000;
- documents on giving into operation of railway equipment, provided by their officials;
- documents on the process of leading and regulating the trains circulation;
- examination and interpretation of technical condition of the elements involved in the incident: relay interlocking system with key button and vertical control panel put in service on December 01<sup>st</sup>, 2009;
- questioning the employees on training, professional knowledge and their interpretation;
- electric schemes of the relay interlocking system with key button and vertical control panel put in service on December 01<sup>st</sup>, 2009, designed and accepted;
- Instruction no.351/1988 for technical maintenance and repair of Control-Command and Signalling equipment;
- Order of the Minister of Transports, Constructions and Tourism No. 2262/2005 on the authorization of staff with responsibilities in the traffic safety , performing, on their own account, railway transport specific activities;
- the instruction for technical maintenance and repair of Control-Command and Signalling equipment (SCB) no.351/1988;
- Order of the Minister of Transports no. 290/2000 on technical acceptance of the products and/or the services necessary for constructing, up-grading, maintaining and repairing the railway infrastructure and the rolling stock for the railway and subway transport;
- the regulation no.005/2005 for the train movement and railway vehicles operation.

### **B.5.4. The functioning of the technical installations, infrastructure and rolling stock**

#### **B.5.4.1. Data found on the interlocking systems**

Before the occurrence of the railway incident the infrastructure manager has initiated works on the Control-Command and Signalling structural subsystem from the railway station CFR Pantelimon through:

- taking out of service, on 15th of June 2008, of the relay interlocking system type CR3 for running and shunting and the replacement with relay interlocking system type CR2 adapted for point machine type EM5 in a.c. and point machines type SIEMENS S700K in a.c.;



- taking out of service, on 01st of December 2009, of relay interlocking system type CR2 adapted for point machines type EM5 in A.C. and point machines type SIEMENS S700K in a.c. and the replacement with relay interlocking system with key button and vertical control panel. On the day of the railway incident this equipment was providing the safety requirements for the organization and railway movement only for lines III and 4.

- with arrivals - departures of trains in the Pasarea and Voluntari direction on running line II
- with arrivals - departures of trains in the Bucharest - Baneasa direction on running line II
- with arrivals - departures of trains in the Bucharest Obor direction.

The relay interlocking system with key button and vertical control panel has in its structure point machines type EM5 in a.c. and point machines type SIEMENS S700K in a.c., and the colour-light signals are designed for the signalling with multiple steps of speed.

The man-machine interface of relay interlocking system with key button and vertical control panel, respectively the key button and vertical control panel are different as signalling mode and operation against man-machine interface of relay interlocking system type CR3.

The relay interlocking system type CR2 adapted for point machines type EM5 in a.c. and point machines type SIEMENS S700K in a.c. wasn't technical certificated.

The relay interlocking system with key button and vertical control panel wasn't technical certificated.

#### **B.5.4.2. Data found on lines**

The lines from the railway station Pantelimon has the superstructure with rail type 60, concrete sleepers T17, indirect fastening type K.

#### **B.5.4.3. Data found out at the functioning of the rolling stock and its technical installations**

The INDUSI installation from the passenger train no. 8013 hauled with the GM 410-747-0 locomotive, was operating and sealed, the safety and vigilance installation operating and sealed, the speed recorder installation was sealed, the locomotive break installation was operating and the brake cock type KD2 was in full braking position.

#### **B.5.5. The man-machine-organization interface**

The railway incident from the railway station Pantelimon can be classified in the incident category based on human errors induced by the system.

The new type of relay interlocking system with key button and vertical control panel was put into operation with 5 days before the moment of the incident and the operating staff wasn't trained on how to work with this equipment wasn't authorized for its handling.



The training and the authorization on the work with the new equipment has as result new knowledge so that they can be easily accessed and used in a variety of contexts, which leads to the ability to cope with new situations and take correct decisions.

The fact that the training and the authorization wasn't made and the short time on the new equipment have made it possible for the movement inspector to enable easily the automatism for action that he had from the work with the old equipment.

The replacement of relay interlocking system type CR2 adapted for point machines type EM5 in a.c. and point machines type SIEMENS S700K with relay interlocking system with key button and vertical control panel, created the possibility that two action sequences can interfere.

Procedural actions developed and strengthened until the automatism phase presents advantages; the actions are progressing quickly, fluently, accurately, with a great economy of time. Where changes occur in the working conditions, in the absence of thorough training, occur the possibility for errors.

The lack of operational staff training and authorization for a new type of equipment makes the system vulnerable and predisposed to human errors.

## **B.6. Analysis and Conclusions**

From the data analysis and evidence the followings resulted:

The entry order from the XOP route signal on line III for the passenger train no. 8013 was performed with call signal because the centralized control didn't work.

The interlocking system electromechanic on duty didn't provide the necessary technical support to resolve the situation.

The route was erroneously performed, without checking the switches positions on the route.

In the railway station Pantelimon, the handling instruction of relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009, wasn't diffused to the interested operating staff; the equipment handling instruction was approved and diffused at 14<sup>th</sup> of January 2010.

The relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009 is different in terms of man-machine interface and design on the signalling and handling mode, against the relay interlocking system type CR3.

The movement staff from the railway station Pantelimon wasn't trained on how to work and wasn't authorized for handling the relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009.

This is a work system because the movement staff on duty from the railway station Pantelimon wasn't authorized for the handling of previous relay interlocking system type CR2 adapted for point machines type EM5 in a.c. and for point machines type SIEMENS S700K. The last authorization of the movement staff on duty from the railway station Pantelimon was for operating the relay interlocking system type CR3.

The acoustic signalling of interruption to train movements wasn't working.

Under this conditions the movement staff was performing the work based on the oral notification by relay interlocking system with key button and vertical control panel maintenance staff or by the constructor.

## **B.7. Incident causes**

### **B.7.1. Direct causes**

The incident occurred as a result of incorrect performance of the entrance for the passenger train no. 8013 at line 4 occupied by the passenger train no. 18207 instead of line 3 free, and due to the emergency signal operation of the XOP signal from the railway station CFR Pantelimon without checking the line and the entrance.

### **B.7.2. Underlying causes**

1. When the railway incident occurred, the handling instruction of relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009, wasn't prepared, diffused and processed with the interested operating staff.

2. The operating staff from the railway station Pantelimon wasn't train on how to work and wasn't authorised for the handling of relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009.

### **B.7.3. Root causes**

The lack of certification/granting of agreement of the relay interlocking system with key button and vertical control panel, operating from 01<sup>st</sup> of December 2009 and its acceptance into operation by the railway infrastructure manager representative without a prior authorization for operation.

## **C. SAFETY RECOMMENDATIONS**

### **C. Safety recommendations**

The recommendations are for solving the following aspects:

1. The public railway infrastructure manager will take all measures for application in the field for putting into operation of structural subsystems and interoperability constituents and certification/granting of agreement for critical railway products. This recommendation was issued also with the occasion of the railway incident investigation on 16<sup>th</sup> of December 2009 in the railway station Basarabi but no action was taken to implement the recommendation.
2. The public railway infrastructure manager will comply with the legislation for authorizing the staff with responsibilities in traffic safety that follows to carry out on own responsibility railway transport activities.

3. The identification by the public railway infrastructure manager in the control measures of:
- interlocking systems not certificated / no agreement granted
  - the operation staff unauthorized for handling the installations (interlocking systems, telephone systems and energy supply systems), and application of legal provisions.

The present Investigating Report will be transmitted to the manager of the public railway infrastructure National Railway Company „CFR” S.A, SNTFC „CFR Calatori” SA, Romanian Railway Notified Body and to the Romanian Railway Safety Authority.

According to the provisions of the Law no.55/2006 on the railway safety, the Romanian Railway Safety Authority will survey the way of implementation of these recommendations.  
Investigation commission members:

- |                        |                          |       |
|------------------------|--------------------------|-------|
| • CONSTANTINESCU Sorin | - investigator in charge | _____ |
| • OLARU Mihai          | - investigator           | _____ |
| • TOADER Doru-Cătălin  | - investigator           | _____ |
| • DRAGHICI Marin       | - investigator           | _____ |