

Investigation and development of safety measures in the European Union railway transport

K. Chruzik*, M. Sitarz**

*Department of Railway Engineering, Silesian University of Technology, Katowice, Poland,

E-mail: katarzyna.chruzik@polsl.pl

**Department of Railway Engineering, Silesian University of Technology, Katowice, Poland,

E-mail: marek.sitarz@polsl.pl

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1. Introduction

The safety of the railway transport reflects the basic criterion for assessment of functioning of the whole railway transport system, moreover it decides about its efficiency and the broadly-taken quality of transport service being offered at the same time. All entities, who are taking part in the different scope in the railway transport apply initially safety-related procedures and subsequently make risk assessment directly associated with the process, that has been implemented due to their acting within the railway system (Fig. 1). This publication has presented the current situation of railway transport in respect of the safety and new legal requirements in the stages of design process, production of products together with their repair the same as during the transport and management of the railway infrastructure with the railway sidings.

The present demands, which are placed on the Member States by the European Railway Agency put the safety criterion above in the management of railway undertakings as its major element. The Safety Management Systems (SMS) and Maintenance Management Systems (MMS) being at present built and implemented in the railway branch rely not only on the system documentation, but also on the risk assessment on the basis of which the Safety Improvement Programs are developed. Risk assessment of certain process, such as for instance transport, management of the infrastructure and production, is a system tool of a great importance, which allows for identification of hazards connected with the main process, but also for estimation of its security situation. The aforementioned make possible to maintain the intended safety level of the process through the corrective actions in order to improve it.

Following groups of operators are being involved in the process of safety assurance in the railway transport (to a different extent):

- railway carriers;
- railway infrastructure managers;
- users of the railway siding;
- railway rolling stock manufacturers.

Entities in Charge of Maintenance (ECM) including maintenance technical workshops. All of these above mentioned railway subjects, are obliged to apply the protective measures and procedures and introduce the obligatory use of risk analysis for processes, that they carry out for the entire railway system [1-2].

2. Railway carrier, railway infrastructure manager

Since the year 2011 each railway carrier as well as the infrastructure manager working within the European Union Region should declare the developed, implemented SMS, that has been approved by the Office of Rail Transportation.

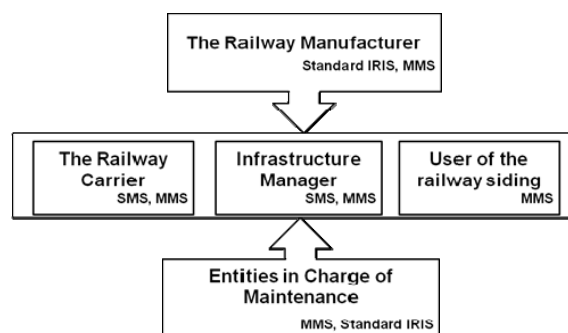


Fig. 1 Executive agents on the railway market

Obligatory implementation of the SMS for both the railway carriers as well as the railway infrastructure managers constitutes the need for system introduction resulting from legal provisions of the Directive 2004/49/EC of the European Parliament and of the Council on the Community's Railways Safety [3-4] in the Article No 9. This Directive was transposed into the Polish law in the Railway Transport Act [5] as well as in a number of regulations [6-13], among others in the Regulation of the Minister of Transport of 19 March 2007 on the SMS in Railway Transport [8] pursuant to Art. 18e of the Act of 28 March, 2003 on railway transport, consolidated text of the Act of 19 January 2007.

These presented above entities have been obliged to obtain:

Security Authorization: is a document confirming the establishment of the infrastructure manager's SMS and his ability to meet the requirements necessary for the safe design, operation and maintenance of the railway infrastructure.

Safety Certificate: is a document confirming the establishment of the Railway SMS by the Railway Carrier and his ability to meet the security requirements contained in the technical specifications for interoperability and other provisions of community law and national law.

The infrastructure managers and railway carriers create the SMS, so that they i.e. these systems [3]:

- fulfil certain type of demands, which are compatible

with character, scale and other conditions of a business conduct;

- control the risk of the new technical and technological solutions, introduced by the railway managers and carriers together with the dangers connected with activity of such railway representatives as for ex.: railway subcontractors, suppliers of materials and services related to the maintenance;
- could take into account the social risk as well as the risk of the third parties activity.

Railway Infrastructure Manager forms the SMS so, that it takes into consideration results of the actions of the railway carriers and their tasks performance in accordance with all the technical specifications of the interoperability, national safety legislation as well as with the conditions included in their Safety Certificates.

System should assure the coordination of the activities carried out by both: the railway infrastructure manager and also the railway carriers during railway accident situations on the given railway network [3].

According to act definition:

Infrastructure manager is an entity performing the activities of managing the railway infrastructure under the terms of the Act, whose functions of the management of infrastructure or a part of it can be fulfilled by different entities. Moreover, the railway carrier is an entrepreneur, who under the terms of the rail transport license performs rail transport services or renders the traction service.

Regardless of the master process specified by the law, these railway entities should within the built and implemented at the same time SMS confirm its application compatibility with the 10 criteria included in the Commission Regulation (EC) of 19th March, 2007. According to this Commission Regulation [7] we can notice 10 major elements responsible for SMS, namely [7]:

- programmes for safety improvement of the railway infrastructure manager and railway carrier determining their objectives in this matter, namely: quantitative and qualitative parameters of obtaining the certain, required level of safety, method of the information transmission included within the Program before an audience consisted of the employees of the railway undertaking (including the strategy of safety in accordance with assessment criteria of the SMS;
- description of legal procedures for implementation and of those, which have already entered into force in the railway undertaking for objectives accepted in the programmes for safety improvement assuring compatibility of the results obtained with the Technical Specifications of Interoperability, national legislation for safety as well as the decisions made by the President of the Office of Rail Transportation (UTK) for safety affairs;
- description of legal procedures for implementation and of those, which have already entered into force in order to assure the maintenance of railway infrastructure, devices serving to conduct the railway traffic as well as rail vehicles in conformity with the standards required in range of current maintenance as well as the whole long-term life cycle;
- detailed descriptions of legal procedures and methods of risk assessment in the railway undertaking

due to the operating activity of the railway infrastructure, the equipment for railway traffic performance and the railway vehicles;

- method of control of risk assessment while running a business on existing conditions, but also in case of changes introduced in the current activities or when the new equipment or materials were implemented, the introduction of which could cause new risk appearance;
- appearance of the staff training programs and systems directly associated with railway traffic performance, with transport of dangerous goods, transport of extraordinary items, concerning the service and maintenance of devices used in railway traffic and railway vehicles conduct and providing the qualifications for railway workers guaranteeing the proper and safe business running;
- solutions within the railway undertaking providing an adequate access to safety related messages and pieces of information within the railway undertaking structure together with the information exchange among the transport process participants on the given infrastructure and also the way of information documenting and type of the control over important pieces of information concerning the safety;
- legal procedures for announcement and documentation of all accidents and incidents, that have taken place for taking the preventive measures in the future;
- existing provisions of the railway undertaking concerning the frequency and internal audit modes as well as the safety system control at different management levels concerning safety related issues;
- other decisions resulting from the plans of action of the railway undertaking, alerting system and notifying the public about the dangers including all the agreements with appropriate public authorities.

SMS similarly to the concept of the management systems should be process – oriented and should have the description of safety processes and procedures applied by the railway undertaking and the railway infrastructure manager, which can undergo the independent audits. System approach or process-oriented is acknowledged as “means of development and improvement of the safety on railways“ in use by the member states. Process approach is referred to as one of eight rules of quality management in the ISO 9000 standard. "More effective result is achieved when both actions and resources associated with them, are controlled as the whole process" [13]. Functioning of each railway organization can be presented in the form of the group of many different, linked with each other processes. These processes are designed to realize the objectives of the given organization with simultaneous minimizing the cost of functioning of these processes and maximization of its safety. Process approach is the term by, which we mean the systematic identification of processes within the organization structures as well as the adequate management of them and their reciprocal liaisons.

In accordance with this methodology Man shall for the presented criteria, identify processes, their mutual relations together with liabilities. Documentation of the SMS should be divided into 3 stages:

- description of activities resulting from the map of processes such as (procedures, instructions);
- risk analysis performance and selection of its method;
- preparation of the Programme for Safety Improvement – Fig. 2.

The SMS requires, that the processes regarding it were identified and described in an appropriate way i.e. (in compliance with the process approach).

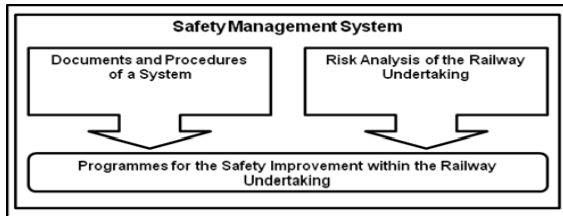


Fig. 2 Safety management system

Next stage of works is the choice of the method of risk assessment and carrying out of its analysis. The Programme for Safety Improvement for next calendar year is prepared on the basis of the assessment of the operational risk, reports issued concerning the railway accidents, analysis of the follow – up protocols. Within this aforementioned Programme qualitative and quantitative objectives were set, which eventuate from the pieces of information in documents as well as from the marketing plan. This presented above model of SMS, on which most of the developed and implemented Polish documentation is based, has been applied by both passenger traffic and freight traffic carriers in Poland. This model fulfils all the criteria resulting from the implementing acts being a consequence of Directive 2004/49/EC as well as the European Union recommendations included within the assessment criteria of the SMS. This presented above model after minor changes is used also by the railway infrastructure managers – the main process constitutes the management of the railway infrastructure.

In connection with duty of the implementation of the Directive 2007/110, it can be easily extended with requirements resulting from development and introduction of the MMS of railway vehicles for the ECM. This problem will be wider described in the further part of this publication.

The railway infrastructure managers, whose railway lines are functionally separated from the rest of railway system, can be released from the obligation of obtaining railway safety authorization, similarly as with the railway lines destined to performance the passenger transport agglomeration and provincial passenger transport within the meaning of the Act of 16 December, 2010 on Public Transport. The obligation to obtain a safety authorization shall be exempt the manager of the private railway infrastructure, which is used exclusively by infrastructure owners for their own freight operations. The requirements to obtain a security certificate are exempt railway carriers carrying only freight on the closed railway lines referred to in paragraph.

3. User of the railway siding

In accordance with definition of the Railway Transport Act [3] a railway siding is a railroad usually

combined with railway line used for loading and unloading of wagons or for maintenance or parking operations of the rail - vehicles and also for movements and turning to railway traffic. The railway siding consists of the signaling devices as well as other type of equipment connected with the safety of the railway traffic, which are situated on it. Each user of the railway siding in Poland has an obligation to confirm, that all the requirements included within the Act and the regulation No [3,7] have been fulfilled and thus obtaining the Security Certificate.

The Security Certificate is a document confirming the ability to safely carry out the railway traffic and the operation of railway transport, issued to entities exempt from the requirement to obtain the security certificate and security authorization [3].

The railway sidings are usually connected with the above presented Operators of the Railway Maintenance (ECM). As observed for the railway carrier, these are technical resources, which enable the proper functioning of the Railway Rolling Stock.

Railway sidings nodes belonging to the railway infrastructure manager allows for carrying out the loading process of the goods. In the above described situations the railway sidings can become the part of the SMS and can be automatically included within the scope of risk analysis. However, there are also the Entities (such as for example producers of large products or very heavy ones), who are only in possession of the railway sidings.

Requirements placed before the railway sidings as far as the railway safety is concerned are being simplified in relation to the demands for the railway carriers and the railway infrastructure managers.

The Railway Transport Act [3] referring to the safety of railway transport defines 3 basic technical and organizational conditions assuring:

- safe conduct of the railway traffic;
- safe exploitation of the rail – vehicles;
- fire and environmental protection.

The Fig. 3 presented below shows the demands regarding documentation indispensable for obtaining the Security Certificate for the railway siding.

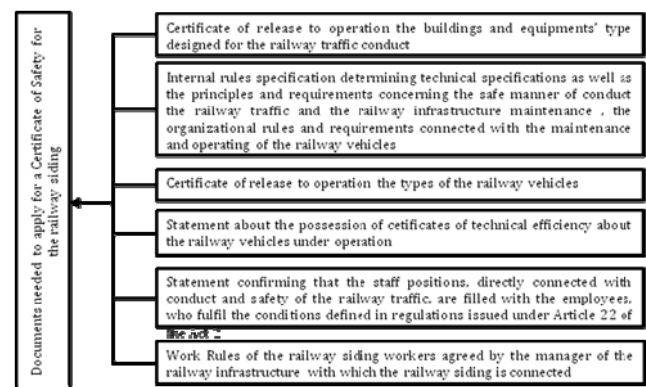


Fig. 3 Safety certificate by the railway siding

In case the railway siding has not been embraced by the risk assessment due to the SMS, there should also be a simplified risk assessment analysis carried out for ex. Checklists method or Failure Mode Effects Analysis (FMEA).

4. Entities in charge of maintenance (including the maintenance workshops)

It has been established [14] in all the member states of the European Union the system of certification of ECM for freight wagons, through the implementation of the requirements of the published on May, 2010, the Commission Regulation (EU) No 445/2011 on the system of certification of ECM for freight wagons, referred to in Article No 14a of Directive 2004/49/EC [4].

The purpose of the system of certification is to indicate, that the Entity in Charge of Maintenance (ECM), has settled his own MMS and, that he is able to fulfil the criteria contained in this regulation in order to ensure, that each wagon, for the maintenance of which he is responsible is driven safely.

System of certification can be applied to each ECM within the scope of freight wagons used in the railway network of the European Union.

The maintenance workshops or any type of an organization, which undertake to make certain part of functions defined in the Article No 4, of the Commission Regulation (EU) [14], can apply the system of certification on a voluntary basis under the provisions of the Article No 8 and Annex No I.

ECM, carries out the functions of management by himself although he can sent out the maintenance related functions to other contractors on the Outsourcing services basis under the current Act No 1 from b) to d) sections of the Commission Regulation) [14], or the part of the functions, subject to provisions in article 8. In case of outsourcing solution, the ECM, ensures that the rules from the annex No I of the Commission Regulation (EU) [14] are applied. Whatever are the agreements introduced concerning the outsourcing, the ECM is responsible for the effect of his activities regarding the maintenance, that he is in charge of. He also establishes a system for monitoring the results of these activities.

The Commission Regulation (EU) [14] determines in a detailed way the mutual relations among the parties involved within the maintenance process, requirements referring to the certificate authorities (in compliance with the Amendment to the Act on Rail Transport [3], the certificate authority is the Office of Rail Transportation), criteria of certification, the role of surveillance system and transmission of the pieces of information to the European Commission and to the Agency. The constructed and implemented MMS makes sure, that the freight wagons for which the ECM is responsible, could be driven in a safe manner.

Taking into consideration the diversity of constructions as well as the methods of maintenance, the aforementioned MMS is a process system. The railway undertakings and the railway infrastructure managers in correlation with the ECM should through their SMS keep under control all the hazards related to their activity involving contractors' services. Therefore, the railway undertaking relies on the contractual arrangements with the ECM in scope of all the operated by them wagons.

These types of arrangements can take the form of either the agreement signed between the railway undertaking and the ECM or the chain of agreements with participation of other railway entities for ex. the owner.

These agreements should be compatible with le-

gal procedures defined by the railway undertaking or the railway infrastructure manager within their SMS including this range of information exchange. The ECM establishes its own MMS and is capable at the same time to fulfil the requirements declared in the Commission Regulation (EU) No 445/2011 in order to supervise, that each single freight wagon, for the maintenance of which he is responsible, could move in a safe manner.

The MMS is made up of the following functions:

- management function, thanks to which a surveillance over the detailed in points b) to d) maintenance functions is possible together with their coordination. It also helps to ensure the secure state of the freight wagon in the railway system;
- function of the maintenance development, which makes possible to take responsibility for document management concerning the maintenance including the management of configuration based on the project and operational data as well as on the results of the actions and advantages coming from the experience undergoing;
- function of the railway rolling stock maintenance management, which enables the management of the withdrawn from use wagon for the maintenance purposes and then its restoring to renewed operation after finishing the process of maintenance;
- the function of maintenance carrying out, which allows to complete the required technical maintenance either of the freight wagon or its part including the documentation of its release to service.

The easiest way to illustrate all the criteria connected with the particular functions of the system is with help of the map of processes for the ECM (Fig. 4). There are the proposals of processes, fulfilling the requirements of the European Commission Regulation (EU) [14], and their functional membership was marked with the different colors.

The ECM ensures, that the functions, which have been described in the points a) to d), were compatible with the requirements and criteria of assessment particularized in Annex III of the Commission Regulation (EU) No 445/2011.

The ECM, carries out the functions of management by himself although he can sent out the maintenance related functions to other contractors on the Outsourcing services basis under the points from b) to d) sections of the Commission Regulation No 445/2011 [14], or the part of the functions, subject to provisions in article 8.

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All ECM, exchange the important pieces of information concerning the maintenance in accordance with the criteria detailed in the sections I.7 and I.8 Annex No III included in the Commission Regulation (EU) No 445/2011.

Therefore, the railway undertaking can in compliance with the contractual arrangements for the operational

purposes, claim the information about maintenance of the freight wagon.

The ECM of such freight wagon responds toward them directly or through other contractors.

In compliance with the contractual arrangements the ECM can ask for the information about operation of the freight wagon.

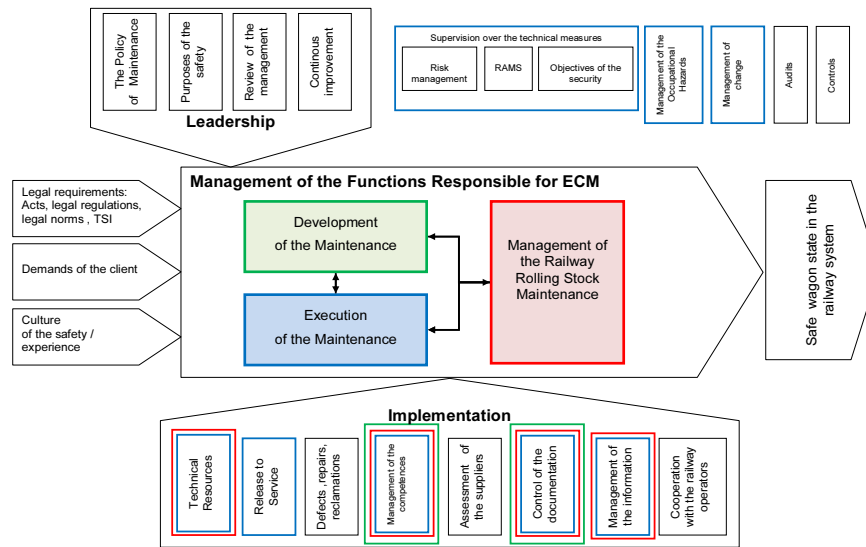


Fig. 4 Proposal of the map of processes for the entity in charge of maintenance ECM

The railway undertaking or railway infrastructure manager deals with such demands either directly or through the intermediary of other contractors.

All contractors exchange information with each other about the irregularities relating to the railway accidents, incidents, potential accident events, and other dangerous events as well as about all possible restrictions of use of the freight wagons.

The ECM ensures safety continuance in the manner that the safe operation of the railway vehicle is guaranteed in conformity with the documentation system for maintenance of units, technical specifications defined within the regulations issued on the basis of Article 20 of the Commission Regulation (EU) No 445/2011 as well as the Transportation Safety Institute (TSI).

The ECM provides the maintenance of railway vehicles alone or surrounded by other certified ECM.

5. Producer of technical measures in favor of the railway transport

Through analysing the causes of certain railway accidents it is impossible to overpass influence of producer's action on the safety in the railway transport.

In accordance with the railway transport act [3] the producers, ECM, suppliers of the materials and spare parts are obliged to assure, that the railway vehicles, railway assemblies, subassemblies and components are met with technical conditions and can be operated by the railway carriers, as well as the railway infrastructure managers, in the safe way.

Moreover, the railway vehicles, railway assemblies, subassemblies and components being in operation in Poland should be released to service by the Office of Rail Transportation, which gives an authorization to movement of railway vehicles on the railway network in the Polish Republic.

The authorisation to operate the unit is a document, which authorises: the railway infrastructure manager,

railway carrier, producer or his authorised representative, importer, contracting entity, modernization contractor, investor, administrator for exploitation of the subsystem or the railway vehicle being introduced for the first time to the utilization.

Proceedings related to the authorization to operate the subsequent railway vehicles in compliance with the type of vehicle, with document confirming its recognition to be put into service, begins with the submission of the application for authorization to operate the unit on the basis of the compliance with the type of vehicle by the railway infrastructure manager, railway carrier, administrator, producer, modernization contractor or importer of the railway vehicle to the President of the Office for Rail Transportation (UTK) or to the national safety authorities from the other member countries of the European Union.

“EC Declaration of Conformity” to an authorized type of rail vehicle: is a statement of the producer or his authorized representative with head office on the territory of the member states of the European Union, contracting entity, modernization contractor, importer, investor, administrator, railway infrastructure manager or railway carrier, which certifies under his sole responsibility, that certain railway vehicle is in compliance with the type of vehicle, whose recognition to be put into service has been confirmed.

“EC Declaration of Conformity with the Type of Vehicle” is being prepared for the following railway vehicles:

- for the vehicles in accordance with the Transportation Safety Institute (TSI)- in conformity with the European Commission procedures for verification in the TSI;
- for non – compliant vehicles with the Transportation Safety Institute (TSI) – in compliance with the European Commission procedures for verification, defined within the modules D or E of Decision of the European Parliament and of the Council No 768/2008/EC of 9 July 2008 on a common frame-

work for the marketing of products and repealing Decision 93/465/EEC (Official Journal of the European Union L 218 from 13.08.2008, page: 82).

Producer of the subsystem or his authorised representative, railway infrastructure manager, railway carrier, administer, importer, investor or contracting entity provides the documentation referring to the conformity assessment for the declaration of EC verification of the subsystem, which he subsequently forwards to the President of the Office for Rail Transportation (UTK) and to the competent authority of each member state of the European Union, which will ask for it.

Declaration of EC verification of the subsystem is a statement of the producer or his authorized representative with head office on the territory of the member states of the European Union, contracting entity, modernization contractor, importer, investor, administer, railway infrastructure manager or railway carrier, which certifies under his sole responsibility, that the subsystem is compatible with the basic requirements referring to the interoperability of railway system.

The Notified Certification Body at the request of the producer of subsystem or the entitled representative, railway infrastructure manager, railway carrier, administer, importer, investor or contracting entity, on the basis of TSI, performs EC verification of the subsystem with the essential requirements for the interoperability of the rail system.

As You can see from the provisions in the law the producer as of today, bears full responsibility for the compatibility of the subsystem with technical conditions and its safe operation by the railway carriers and railway infrastructure managers.

So wide scope of the producer's responsibility results also directly from the provisions of the Civil Code in conformity with which a man (manufacturer), who produces for his business a dangerous product is responsible for the damage caused by this product to anyone.

There is an exception to this rule under the Article 449 of the Civil Code, where has been mentioned the vicarious liability for damage caused by the dangerous product.

The vicarious liability may be imposed on the following railway representatives:

- co-founders of the product (producers of the materials or the raw materials, manufacturers of the component of the product);
- persons, who claim to be the manufacturer of the product so called (quasi-producers);
- importers;
- sellers of the dangerous product (in case of no possibility for identification of the producer).

The importance of the producer's responsibility as well as the scale of the problem can be evidenced by the fact of recent appearance of possibility of the risk insurance of the producer (on the basis of the Law of 22 May 2003 on Compulsory Insurance ... Journal of Laws No 124, item 1151 and 1152). Subject of such an insurance covers personal liability of the manufacturer for personal injuries or property damages suffered by anyone in connection with the use, application or consumption of a product or group of products defined in the insurance contract:

On the other hand in compliance with the requirements of the newest management standards in the undertaking including the railway branches resulting from the IRIS standard, the producer is obliged to carry out the analyses, which allow for defining the possibilities of performance as well as assessment of the potential risk in the criteria:

- timely delivery of the product;
- compliance with the accepted economic plan;
- fulfillment of the specific requirements of the client;
- meeting the applicable legal, normative requirements and recommendations of railway organizations;
- provide the necessary reputation and position of the company on the market.

In 1991 the UNIFE (Union of the European Railway Industries) has been brought to life.

The intention of this organization became the promotion and disseminating of the railway transport in the countries of the European Union. Z przedsiębiorstw, które weszły w skład UNIFE jako pierwsze - faktycznie były założycielami - warto wymienić kilka firm, które są firmami o globalnym zasięgu, np. ALSTOM, BOMBARDIER, SIEMENS, SECHERON, KNORR - BREMSE, ANSALDOBREDA. The companies, which became part of UNIFE first - in fact they were the founders - it is worth mentioning a few companies, which are companies with global reach, such as Alstom, Bombardier, Siemens, Sécheron, Knorr - Bremse, ANSALDOBREDA.

In the framework of the UNIFE working group has been established (IRIS group) to define and disseminate management standard specifically for the rail industry, based on ISO 9001:2000 but tailored to the specific requirements of the rail industry.

Standard was supposed to put tremendous pressure on the management model through the projects (undertakings) - Project Management, supply chain improvement, change management and its supervision, maintenance, etc.

Purpose of the IRIS standard is:

- implementation of the global and uniform assessment system of the producers for railways;
- create a fully transparent, characterized by the high quality supply chain.

The standard is characterized by the universal language, uniform guidelines for evaluation and mutual recognition of audits.

Successfully completed implementation of the IRIS will contribute to the situation, when the benefits will be provided both for the railways' producers i.e. (the producers, subcontractors of the railway equipment, information systems for railways) as well as for their customers i.e. (ultimate manufacturers of railway infrastructure, rolling stock holders).

Advantages of the implementation of the IRIS:

- increase of the quality of the whole supply chain;
- increase of the effectiveness of an assessment and approval sub-suppliers for railways;
- reduction of costs of manufacturers and sub-suppliers;
- improvement of an access to specific and important data concerning the producers for railways, which aims to improve both the cooperation and business-

- es realization in branch;
- uniform, recognized worldwide certification instead of different producer's standards;
- augmentation of the efficiency of the railway rolling stock devices.

Standard includes within its scope the following: design, production, service and the modernizations with the repairs of the sub-assemblies and railway vehicles such as (locomotives, passenger wagons, freight wagons, trams, subways).

Requirements of the IRIS standard are sufficiently high. There is a requirement to possess 21 documented processes.

We should place as a specific requirement of IRIS at least the obligation of carrying out the RAMS analysis (Reliability, Availability, Maintainability, Safety), LCC (Life Cost Cycle Analysis) performance of product and services realization as the project on the basis of the Project Management methodology (integration management, time management, managing the range, the budget, communication, human resources etc.). The IRIS is also focused on the supervision of non-compliance in business processes within a company, which underlies an assumption, that the cause of inconsistencies in the product is previously mentioned inconsistency in process. Also the process of auditing shall follow in a slightly different way. The first stage consists of the „Zero Audit,, i.e. review of the System Readiness, during which all processes and procedures together with so called Questions KO (eliminating) -12 questions, are being examined. The successful pass of answers on these questions is a condition to move to the next part of the audit i.e. Adequate Certification Audit, which has to be held within 90 days maximally from the date of the beginning of the „Zero Audit”

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K. Chruzik, M. Sitarz

SAUGUMO PRIEMONIŲ EUROPOS SĄJUNGOS GELEŽINKELIŲ TRANSPORTE TYRIMAS IR DIEGIMAS

R e z i u m ė

Saugumas geležinkelių transporte atspindi pagrindinį rodiklį vertinant visos geležinkelių transporto sistemos funkcionavimą, dar daugiau jis liudija apie šios sistemos efektyvumą ir plačiąją prasmę apie tuo pačiu metu teikiamą transporto aptarnavimo kokybę. Visos struktūros, kurios geležinkelio transportui skirtingomis apimtimis taiko su saugumu susietas procedūras, paskui atlieka rizikos susietos su procesu, kuris buvo įdiegtas geležinkelio sistemoje vertinimą.

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INVESTIGATION AND DEVELOPMENT OF SAFETY MEASURES IN THE EUROPEAN UNION RAILWAY TRANSPORT

S u m m a r y

The safety of the railway transport reflects the basic criterion for assessment of functioning of the whole railway transport system, moreover it decides about its efficiency and the broadly-taken quality of transport service being offered at the same time. All entities, who are taking part in the different scope in the railway transport apply initially safety-related procedures and subsequently make risk assessment directly associated with the process, which has been implemented due to their acting within the railway system.

Keywords: Safety Management Systems (SMS), Maintenance Management Systems (MMS).

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