

## SUMMARIES

### ARTICLES

#### **Andrzej Aniszewicz: Enlargement of the Metrology Laboratory's Scope of Accreditation for the Procedure of Calibration of Devices for Measuring the Height of the Bumper Axis above the Rail Head**

The article describes work performed at the Length and Angle Section of the Railway Research Institute's Metrology Laboratory. The main calibration areas as well as kinds of calibrated objects, samples and measuring tools have been presented. The notions of accreditation and calibration have been explained. The results of the Section's own projects concerning the construction of the stand for testing tools for measuring the height of the bumper axis above the head of the rail have been described. The primary technical parameters have been presented. Moreover, the advantages resulting from the construction of the stand for calibration of tools for measuring the parameter "the height of the bumper axis above the head of the rail" and the accreditation of two developed measuring procedures, particularly the advantages concerning the credibility of acquired calibration results have been characterized.

**Keywords:** metrology, accreditation, calibration laboratory, calibration, height of the bumper axis above the rail head

#### **Stanisław Gago: Selected Issues of Safety in Railway Transport**

The article features selected safety issues in railway transport. The specific character of railway transport concerning its safety for passengers and staff, both in infrastructure and vehicles (traction vehicles, wagons) has been described.

Railway transport safety should be constantly enhanced along with technical progress in this area. There are currently being implemented modern monitoring systems of railway infrastructure facilities and vehicles, systems detecting defects of railway track and vehicles during movement as well as highly effective and sophisticated systems of rail operation which by their nature improve rail transport safety. New threats appear with technological progress such as disturbances in computer systems' operation which may cause serious disruption in railway operation and its organization. Therefore ensuring cyber security for these systems is of vital importance.

Another crucial issues connected with railway safety is so called safety culture whose task is to develop appropriate procedures to eliminate or decrease the effects of failures of railway traffic signaling, command, control and management systems.

Chapter 1 includes selected threats that may emerge in railway transport, stressing the cost of terrorist attacks in rail transport in Europe. Chapter 2 presents the characteristics of railway transport in the aspect of public safety. Chapters 3 and 4 refer to systemic railway transport safety in the area of safety and security. Chapter 5 concerns safety culture in railway safety that should be created by its users (stakeholders), i.e. administration, carriers, and infrastructure operators. These entities should create the so called organizational and decision-making being connected with railway operation safety. Chapter 6 includes considerations on railway operation safety which should be permanently monitored and follow technical progress implemented in railway transport.

**Keywords:** rail transport, danger, threat, safety, safety culture

#### **Łukasz John: Modes of Elimination of Radio Disturbance Conducted in Carriage Converters**

The article features potential main sources of radio disturbance which may appear in multi-system carriage converters or auxiliary static converters mounted on urban rail vehicles such as trams, metro or rolling stock. There has been described a method to test carriage converters in the area of emissions of conducted disturbance on their high voltage power supply input port and low voltage power supply output ports in reference to normative permissible levels of radio-electric disturbance emissions. Moreover, practical ways to protect carriage converters against the effects of high values of radio disturbance resulting from poor design of the device during its design and production, have been presented.

**Keywords:** electromagnetic compatibility, radio disturbance, permissible emission level, carriage converters

#### **Szymon Klemba: Digital Model of the Railway Network – Development of a Tool for Passenger Transport Analyses**

The article relates to a railway network model presented in a project entitled "Digital Model of Transport Network. Stage 1: Railway Network". The scope of the project includes coding Poland's current railway network according to developed earlier classification criteria of railway network points and sections as well as the specification of data necessary to take into account in the model, describing particular elements of the railway network. The project aims at acquiring a useful tool to carry out current research

and commercial projects of the Railway Research Institute as well as to create an opportunity to develop the tool further.

**Keywords:** railway transport, transport modelling, transport system

### **Janusz Poliński: National Plans for the Implementation of TSI PRM for Selected European Railways – German Railways**

The article includes the German National Plans for the Implementation of TSI PRM. Information from data from Federal Statistical Office (Destatis) acquired in 2013 and related to the population of the disabled in Germany has been outlined. The status quo of the existing German railways' infrastructure and rolling stock used in long-distance and local traffic has been described. The scope of activities planned to improve the accessibility of railway stations and rolling stock has been presented. A separate chapter refers to German principles of financing works to improve accessibility for the disabled in railway transport.

**Keywords:** rail transport, accessibility, disabled

## RESEARCH INFORMATION

### **Renata Barcikowska: Participation of Railway Research Institute in Research and Development Projects**

A Joint Venture "BRIK – Research and Development in Railway Infrastructure" is a programme supporting research and development projects in the area of railway infrastructure carried out by the National Center for Research and Development (NCBR) and Polish Railway Lines (PKP Polskie Linie Kolejowe S.A.). The Railway Research Institute submitted a total of 10 research and development projects to the NCBR. The applications were received from 30 October 2017 to 12 January 2018. The Joint Venture will last till the end of 2023.

**Keywords:** scientific tests, research and development projects, railway infrastructure

### **Danuta Milczarek: Emission of Toxic Gases Emitted During Combustion of Materials**

The article presents the assumptions of a research project carried out by the Railway Research Institute relating to testing the impact of heat radiation intensity on the emission of

toxic gases emitted during combustion. The FTIR technique (Fourier-transform infrared spectroscopy), testing apparatuses and the scope of research have been described.

**Keywords:** railway, fire safety, fire behavior, test methods, toxicity, FTIR

### **Iwona Wróbel: Accessibility Strategies for Passenger Infrastructure according to TSI PRM**

The article presents selected accessibility aspects of rail passenger infrastructure for persons with disabilities according to European and Polish legal documents. Requirements regarding the obligatory content of the strategy to access each passenger railway station, including operation regulations have been described. Due to the lack of such documents for Polish railways, a proposal for a methods using detailed data on railway infrastructure facilities has been put forward basing on a specially prepared questionnaire.

**Keywords:** strategy, accessibility, technical specifications for interoperability, Passengers with Reduced Mobility sub-system

## RESEARCH EVENTS

### **Przemysław Brona: 23rd Scientific Conference "Rail Vehicles 2018"**

On 22–25 May 2018, the 23rd Scientific Conference "Rail Vehicles 2018" was held in Katowice, Chorzów and Szczyrk. The article contains the agenda of the conference and topics of speeches presented there. The conference was attended by Railway Research Institute's employees who presented many interesting speeches concerning research on rail vehicles construction and operation.

**Keywords:** scientific conference, rail vehicles, rolling stock

### **Magdalena Garlikowska: Participation of the Railway Research Institute at the 6th International Scientific Conference "Transport 2018"**

The short article concerns the 6th International Scientific Conference „Transport 2018 – New Organizational and IT Solutions in Transport” organized in Kazimierz Dolny by University of Economics and Innovation in Lublin (WSEI), Faculty of Transport and Computer Science. The article contains the subject-matter of the conference and summary of

the Railway Research Institute's representative's presentation on the role and significance of risk assessment in rail transport.

**Keywords:** conference, transport, risk analysis

### **Agata Pomykała: 10th UIC World Congress on High Speed Rail**

The 10th UIC World Congress on High Speed Rail under the heading Sharing Knowledge for Sustainable and Competitive Operations was held in Ankara on 8–11 May 2018. The congress was attended by over 1000 representatives of 30 countries, including four representatives from Poland – from the Railway Research Institute. The aim of the article is to get the reader acquainted with principles of the congress preparation and organization and the Institute's employees' participation.

**Keywords:** rail transport, high speed rail

### **Michał Rudowski: 3rd Scientific and Technical Conference "IT in Railway Transport"**

The article contains information concerning the scope and course of the 3rd Scientific and Technical Conference "IT in Railway Transport" which was organized by the National Board of the Society of Transport Engineers and Technicians of the Republic of Poland and PKP Informatyka spółka z o.o. at Dom Technika NOT in Warsaw on 2 September 2018.

The conference was held under the heading "IT – the Key to Railway Modernization". Its primary aim was to exchange experience and acquire information on innovative ITC solutions in transport and build relations aiming at better understanding of railway companies' needs in the area of effective, optimal and efficient IT solutions for railways. The conference focused on the following themes: public transport integration, transport digitalization, solutions supporting new business models in freight transport, cyber security and fixed assets management.

**Keywords:** IT, railway transport, new technologies, cyber security, transport integration

### **Iwona Wróbel: Scientific Seminars at the Railway Research Institute in the First Half of 2018**

The Railway Research Institute has been conducting scientific seminars for many years, the thematic scope of which covers key issues in the field of railway transport. The series of meetings serve to broaden knowledge in the field of innovative solutions and the possibilities of their practical application and exchange of experience in the development of new technologies. The article describes the issues presented at the four seminars which were held from March to June 2018. The presentations concerned in particular: tests of residual stresses occurring in the bogie frame, wear of wheelsets in freight wagons and subjects related to traction vehicle brakes.

**Keywords:** scientific seminar, railway vehicle, bogie frame, wheelset, brake, electric traction unit