

SUMMARIES

ARTICLES

Janusz Poliński: Automatic Coupling of Rolling Stock. Part I – History of the Development of the Automatic Coupler

This article presents a historical outline of the evolution of automatic couplers worldwide. The development of rail transport and the associated growing demand for rolling stock, is connected with the need for frequent coupling and uncoupling of wagons. The frequent operation of the screw coupler was hard and dangerous work for railway staff, hence the search for solutions to improve this process and guarantee increased safety. The automatic coupling became such a solution. Due to the high strength of the coupler, it was possible to increase the capacity of the wagons and thus the train capacity and length. The article describes the problem of automatic couplings for rolling stock and the evolution of coupling design development, which is a consequence of technological advances and the possibility of using new materials. Technical solutions of couplings are also presented, such as: Jenny, Wilson, Scharfenberg and many others, as well as interesting solutions of mechanisms eliminating manual work in connecting screw couplings used in traction vehicles during shunting works, including a device designed in Poland. Various solutions for automatic couplers, most of which are not compatible with each other, are also outlined. Readers interested in the subject-matter are offered interesting films illustrating the content discussed. A description of the development of a unified automatic coupling design for European railways is omitted in this article, as this will be the subject of Part II of the article.

Keywords: rail transport, connecting rolling stock, automatic coupler

Eliza Wawrzyn: Railway Research Institute's Participation in European Conference of Transport Research Institutes ECTRI

The European Conference of Transport Research Institutes (ECTRI) is an international non-profit association that was founded in April 2003. As Europe's leading research association, ECTRI deals with sustainable and multimodal mobility. It aims to provide scientific competence, knowledge and advice to move towards the green, safe, efficient and inclusive transport of people and goods. This article describes the key features of the ECTRI association, its missions and strategic goals, and the participation of IK in its activities and dedicated thematic areas.

Keywords: strategy for transport, multimodality, mobility research, transport association

Paweł Winciorek: Light Traction Vehicles. RW60EM Type Vehicle Placing in Service

The article presents information on selected "light" traction vehicles used for shunting work, controlled by radio, not equipped with an operator's cab. As an example of such a vehicle, a specialised traction vehicle of the RW60EM type designed for specific shunting work on, among others, a railway siding, and the process of its placing in service in Poland are presented. The specific shunting work is due to the vehicle's operating conditions in the track, as the vehicle is connected by an approximately 180 m long cable reeled on a drum, which significantly limits its range of use.

Keywords: railway transport, railway vehicle

Iwona Wróbel: Transport in Shaping the Quality of Life in Smart Cities

The article presents the topic of smart cities as a new direction using the application of modern information and communication technologies (ICT) in sustainable urban development. The ISO 37120 standard for measuring urban services and quality of life is described, in particular indicators related to transport. Five Polish cities which have been certified in accordance with the ISO standard are indicated. Examples of solutions applied in Gdynia, Gdańsk, Kielce, Lublin and Warsaw may serve as a model and inspiration for other cities to improve the conditions of functioning of urbanised areas and create friendly places for residents to live.

Keywords: smart city, urban policy, information technologies, ISO 37120 standard, certification, urban transport, public transport

RECENT EVENTS

Renata Barcikowska: Scientific Conference of the 70th Anniversary of the Railway Research Institute and the 25th Anniversary of the IK Test Track Centre

On 15 March 2022, a scientific conference was held in Warsaw to mark the 70th anniversary of the Railway Research Institute and the 25th anniversary of the IK Test Track Centre in Żmigród. The event was divided into two parts: the official and the substantive ones. In the official part, a paper on the history of the Institute was presented. During the three thematic sessions comprising the substantive part, 10 papers were delivered, which were devoted to the ongoing scientific and research work and the development prospects of the Institute's activities.

Keywords: scientific conference, test centre, Railway Research Institute

Agata Pomykała: Railway Interdisciplinary Conference “UIC Day in Poland”

The article presents information related to the conference entitled ‘UIC Day in Poland’, organised by PKP S.A. on 6 April 2022. The conference was focused on the possibility of strengthening cooperation with the International Union of Railways (in French – *Union Internationale des Chemins de fer* – UIC), as well as with companies and railway institutions operating in Poland. The leading topics of the conference covered research and development, implementation of innovations in the railway system, and perspectives of the rail freight market for sustainable development of transport, including freight transport and standardisation in rail transport. The presentations also dealt with issues related to the new economic reality and changes resulting from the post-Covid situation.

Keywords: public transport, rail transport, railways, UIC

INFORMATION ON PUBLICATIONS

Andrzej Białoń: Overview of the Key Electromagnetic Compatibility Issues in High-Speed Rail Direct-Current Traction Operation

The monograph, published in English, deals with the issues of ensuring electromagnetic compatibility of electrified DC traction railway lines during the operation of high-speed rolling stock. The monograph presents general problems of electromagnetic compatibility of DC traction systems, the results of experimental tests of electromagnetic compatibility, the construction of electromagnetic interference models in DC traction systems and in command-control and signalling devices. The different aspects of electromagnetic compatibility between the electric traction power system and the traction rolling stock on the one hand and

the command-control and signalling devices on the other are also shown. The required level of electromagnetic compatibility of DC traction power supply equipment and traction vehicles with other equipment should be achieved by essential and technically feasible measures. These activities should be based on a reasonable configuration selection of the systems involved and the parameters of the infrastructure. Examples of such measures are also shown in the monograph.

Keywords: disturbances, electromagnetic compatibility, railway traffic control devices, high-speed rail, DC traction

Jarosław Moczarski: Scientific Research for the Development of Rail Transport Young Staff of the Railway Research Institute in the Implementation of Research Projects

The scientific monograph, published in December 2021 by the Scientific Publishing House of the Railway Research Institute, is devoted to research projects carried out by young researchers of the Institute. The publication describes the results of research work on fire safety in passenger rail vehicles, noise generated by high-speed trains, stability of freight wagons, construction of road-rail vehicles, physicochemical properties of paint systems used in rail transport, electromagnetic compatibility in the railway environment, selected elements of railway infrastructure and their impact on rail transport safety and reliability, certification processes of railway subsystems, the role of simulation tests in rail transport, wire communication systems and implementation of radio digital ICT technologies. The results of the research work were presented at the IK Young Talents’ Symposium – SYMTA 2021, organised in May 2021 at the Railway Research Institute.

Keywords: rail transport, scientific research, young scientists