SUMMARIES

ARTICLES

Jarosław Moczarski: Test Stand for Simulating Rolling Stock and Cargo Movements on the Railway Network

The test stand built in the laboratory of the Railway Research Institute enables non-contact measurement of distance, displacement and spatial position of moving objects. The new test track ensures continuous movement of the objects under examination and their repeated passage through the vision zone. The stand is a model of a railway track divided into sections, on which independent bogies (or sets of bogies) carrying loads of different shapes and dimensions move. It makes it possible to model and simulate the movement of real objects (carriages, trains) and to control this process. It permits the testing of new methods of identifying rolling stock and loads and controlling the movement of vehicles.

Keywords: research stand, modelling and simulation, rolling stock location, identification of objects, active vision systems, rolling stock and cargo recognition

Janusz Poliński: Exploring the Railway of the Future – Hyperloop

The article outlines the ongoing efforts surrounding the fifth mode of transportation (after rail, road, water, and air transport), which is the Hyperloop system. The technology of this system is based on three elements: the tube (inside which air pressure is significantly reduced), the vehicle (a levitating capsule), and the terminal (a place for exchanging passengers or carrying out cargo activities). Although the idea of the solution was popularised by Elon Musk, the history of the first concepts dates back to the 18th century, as evidenced by the examples cited. The information includes descriptions of historical solutions and highlights the main companies currently involved in the development of this transport system, conducting basic research aimed at future use of this ecological technology for transporting people and goods.

Keywords: rail transport, high-speed rail, magnetic levitation, hyperloop system

Janusz Poliński: Exploring the Railway of the Future – MagRail

The article from the series "Exploring the Railway of the Future" outlines solutions utilising magnetic levitation on the existing conventional network. The idea of such transport was considered in the USA, but a significant role in this field belongs to Polish technical thought, the effects of which are visible in the subsequent steps of developing the MagRail system technology. A decisive role in this area was played by the company Hyper Poland, founded in 2016 at the Faculty of Power and Aeronautical Engineering (MEL) of the Warsaw University of Technology. Its activities are now continued by Nevomo, which collaborates with a number of specialists from various technical fields. The MagRail technology has already been recognised by the European railway industry. This is confirmed by several signed agreements, including with the Italian infrastructure manager Rete Ferroviaria Italiana, the largest German inland port Duisport, and the French railways SNCF. The first 1:5 scale demonstrative version of MagRail was presented by Nevomo in 2019. Successful tests on a 1000 mm track were conducted in December 2020. In 2022, in Nowa Sarzyna, Nevomo completed the construction of a full-size test track, which is the longest track for testing passive magnetic levitation in Europe. Tests of new magnetic levitation solutions in the Subcarpathian region have already begun. In the next phase, in collaboration with GATX Rail Europe, they will be expanded to include MagRail Booster tests with conventional freight wagons.

Keywords: rail transport, high-speed rail, magnetic levitation, MagRail system

Artur Rojek: Tests of the innovative lighting infrastructure management system LMP

The article outlines the research programme entitled "Innovative Lighting Infrastructure Management System (LMP) on the Network Managed by PLK S.A". It also presents the results of laboratory, field and operational tests. The tests confirmed that all mentioned elements of the LMP system meet the requirements of the relevant standards and normative documents of PKP PLK S.A. and can be safely used on the railway infrastructure.

Keywords: lighting of railway areas, intelligent external lighting systems, energy consumption for lighting purposes

RESEARCH INFORMATION

Adrian Kaźmierczak: Safety at interoperable rail hydrogen refuelling stations

This information outlines the main assumptions of the WP 9 package, which concerns the safety issues of hydrogen

refuelling stations, implemented as part of a project created by the public-private partnership of Europe`s Rail. The Railway Research Institute, along with Polskie Koleje Państwowe and associated entities, participates in the project. Innovative hydrogen technologies, to be widely used in rail transport, must have proper grounding in standards, norms, technical specifications, etc., that will ensure the safety of the entire railway system. The participation of the Railway Research Institute in the WP 9 package aims to contribute to the development of appropriate codes of conduct and standards dedicated to hydrogen refuelling stations, directly impacting railway safety.

Keywords: rail transport, hydrogen refuelling stations, safety

Szymon Klemba: Possibilities of Implementing a Cyclical Train Timetable on Railway Lines in Olsztyn Junction

The information describes the independent project carried out in the Track and Operation Department of the Railway Research Institute, which involved evaluating the feasibility of creating an integrated transport system in the Urban Functional Area of the city of Olsztyn, based on regional and suburban rail services operating according to a cyclical timetable. Assumptions for the development of a cyclical timetable were defined and then developed for the analysed area, proving the possibility of its implementation without the need to undertake investment activities. Infrastructure problems affecting the quality of the cyclical timetable were identified.

Keywords: integrated transport system, cyclical train timetable