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Editor's

Andrzej Massel

Director of the Railway Research Institute



Dear Readers,

Almost immediately after Poland regained its independence, research on various areas of railways was launched. This research was concentrated at the Experimental Division of the Ministry of Railways, established in 1923. The understanding of the research needs in the railways of the reborn Polish state was possible due to a number of talented engineers and

number of distinguished professors, who had gained great authority while the Partitions were still in progress. These included Professors Albert Czczot and Aleksander Wasiutyński. The research undertaken in the inter-war period was very important for the development of railway technology in Poland, and the research methods developed at that time were also used to meet the needs of the Polish railway industry in the period after the Second World War.

By the order of the Minister of Railways on 30 May 1951, the Railway Science and Research Institute was established in Warsaw. Its origins were the Experimental Department of the Ministry, from which the Institute took over all personnel, rolling stock and measurement equipment, and from which the Rail Vehicles Department was formed. The Institute's Central Research Laboratory was established and also the Road

Department and the Operation Department, as well as the Documentation Department were set up.

Just as in the early years of independence, after the Second World War there was an awareness that practically all railway administrations had specialised research units dealing with the use of technological advances for the benefit of the railways, as well as with the imposition of solutions desired by the industry on the railways. The need for the establishment of the Institute was prompted primarily by the rapid development and constant modernisation of the means of transport seen in the post-war period.

The importance of the establishment of the Railway Science and Research Institute in 1951 is primarily due to the fact that, from then on, the entire complex of research issues relating to rail transport could be carried out within the structure of a strong research unit with an extensive laboratory base. That favoured, and continues to foster, the interdisciplinary nature of the research carried out. Over the 70 years of the Institute's existence, its formal location has changed, and the scope of the research carried out has also changed, just as the needs of the Polish railways have changed.

The scientific and research staff of the Railway Research Institute have continued the work initiated by Albert Czczot and Aleksander Wasiutyński.

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Vehicle tests at the Brakes Tests Section in Cracow

The Brakes Section in Cracow has completed testing of the 36WEha hybrid vehicle for the Łódź Agglomeration Railway,



Photo 1. 36WEha hybrid vehicle produced by NEWAG S.A.

produced by NEWAG S.A., and the 45WEa electric multiple unit for SKM Warszawa, also produced by NEWAG S.A.



Photo 2. 45WEa multiple unit produced by NEWAG S.A.

Crash test on the IK test track in Żmigród

On 8 April 2022, on the premises of the Test Track in Żmigród, the Rolling Stock Testing Laboratory of the Railway Research Institute carried out a crash test of the 228M type rail bus cab. The test was conducted in accordance with the requirements of EN 15227. The scope of the test included the second case of the crash scenario. This scenario was realised as a collision between a part of a rail bus equipped with energy absorbing

elements and a flat wall mounted on a non-moving, unbraked car.

The aim of the test was to experimentally verify strength calculations made to determine the crashworthiness of the structure, and to check how the cab and the equipment mounted on it would behave during a real impact with a rigid wall of a second rail vehicle.

UIC Day in Poland

On 6 April 2022, after many changes concerning the date, the UIC Day in Poland conference, organised by PKP, was held with the participation of the President of the International Union of Railways (UIC) Krzysztof Mamiński and UIC Director General François Davenne. The participants included representatives of many institutions involved in cooperation with PKP. Among them were also representatives of the Railway Research Institute - Marek Pawlik, Deputy Director for Railway Interoperability and Agata Pomykała, Senior Specialist in the

Department of Project Coordination and International Cooperation.

During the conference sessions and workshops, strategic priorities of innovation and competitiveness development and perspectives of cooperation between UIC and PKP were discussed. The workshops focused on research and innovation, development of railway business and synergies between the railway sector and cities of the future.

Reactivation of the Section of the Association of Engineers and Technicians of Transportation of the Republic of Poland

Since 1 January 2007, a Section of the Association of Engineers and Technicians of Transportation of the Republic of Poland (SITK RP) has been operating in the Railway Research Institute. The Section was reactivated after years of suspension of the SITK RP Section at the Railway Scientific and Technical Centre (former name of the Railway Research Institute).

Currently, the SITK RP Section at the Railway Research Institute has 21 members, including outstanding scientists,

specialists and academic teachers in the field of telecommunications, communications, safety and certification of the railway sector.

One of the major achievements of the SITK RP Section was the organisation of the ERTMS (ETCS and GSM-R) symposium in 2011, covering the issues of its implementation in Poland, attended by employees of the railway sector from all over Poland and members of other SITK RP Chapters, not only from the Warsaw Branch of SITK RP.

IN MEMORIAM

*The dead's eternity lasts forever,
as long as they are remembered.*

Wisława Szymborska

Dr. Eng. Andrzej Żurkowski

Director of the Railway Research Institute Obituary



Death is always out of place and always out of time...

Dr. Eng. Andrzej Żurkowski, long-serving Director of the Railway Research Institute and a person of great merit to the Polish railway, died on 3 January 2022 after a serious illness. His passing away is an irreparable loss to his family, friends, colleagues and the scientific community.

He was born on 29 November 1956 in Warsaw. Graduated from the Institute of Transport at the Warsaw University of Technology (PW). Doctoral degree in technical sciences received in 2008 at the Faculty of Transport, Warsaw University of Technology.

Since his graduation, he was associated with the Polish State Railways and railways were his professional and life passion. In 1980-1991, he worked at the Railway Scientific and Technical Centre - initially as an engineer, and since 1990 as head of the Railway Track Operations Department.

In 1991-1998, he was Head of Department in the General Directorate of PKP, while in the period of 1998 to 2001, he held the posts of Marketing Director of High Quality Passenger Transport Services, and spokesman for the PKP Passenger Transport Directorate. Founder and first President of the Management Board of PKP Intercity in 2001-2005.

In 2006, he became director of the Railway Scientific and Technical Centre, which was transformed into the Railway Research Institute in 2010. He served in that position until 2021. His great experience and commitment contributed to the growth of the Institute's position both in Poland and internationally. Throughout his professional career Andrzej Żurkowski was very active in working groups, committees and subcommittees of the International Union of Railways (UIC).

He willingly shared his theoretical and practical knowledge. In 2007-2011, he lectured at the Military University of Technology, Warsaw University of Technology and Warsaw School of Economics. He participated in many national and international scientific and technical conferences and seminars, where he delivered papers and lectures on passenger transport. He had a rich scientific and research output. He was the author of around 130 articles and over 100 papers on rail transport. He co-authored many books. In recognition of his position and scientific authority, he was elected to the board of the International Railway Research Board IRRB. He was also a member of the UIC High Speed Steering Committee.

Director Andrzej Żurkowski will be remembered by the Institute's staff as an open-minded director who respected his subordinates. He was a righteous man of great knowledge and faith.

He was cheerful and kind by nature. He was characterised by gentleness and calmness. He was not only a high-class professional, but also a warm-hearted person, a social activist, a man of dialogue; a loving husband, a proud father of two daughters and four grandchildren. He loved cats, theatre and swimming, and collected miniature buses.

The late Director Andrzej Żurkowski was buried at the cemetery in Rembertów, Warsaw.

Sit ei terra levis.

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70th anniversary of the Railway Research Institute (IK) 25th anniversary of the Centre for the Exploitation of the IK Test Track

Marek Pawlik

Deputy Director for Railway Interoperability, Railway Research Institute,
Chairman of the Institute's 70th Anniversary Organising Committee



Railway Research Institute since 1951

The Railway Scientific and Research Institute (Instytut Naukowo Badawczy Kolejnictwa INBK) was set up in Warsaw on the 30th May 1951 by the Decree of the Minister of Railways (No. 763), which moved both railway-related ministerial staff and test equipment from Ministerial Experimental Department to a new external structure dedicated for scientific and research support for railways in Poland.

Its name was then changed three times:

- from INBK to Central Research and Development Centre for Railway Engineering (Centralny Ośrodek Badań i Rozwoju Techniki Kolejnictwa COBiRTK) in 1958;
- from COBiRTK to Railway Scientific and Technical Centre (Centrum Naukowo Techniczne Kolejnictwa CNTK) in 1987; and
- from CNTK to Railway Research Institute (Instytut Kolejnictwa IK) in 2010.

Regardless of the changes of the name, since 30th May 1951, the Railway Research Institute continuously supports railway transport development in Poland undertaking different types of tests, analyses, studies, and other activities supporting legal, technical, and business decisions which are being taken.



Photo 1. Congratulations from the President of Polish NSA

The Covid 19-related challenges of the 2020 and 2021

The Railway Research Institute's seventieth anniversary should have taken place in May/June 2021. Unfortunately already at the beginning of 2020, as the result of Covid 19 pandemic restrictions, significant doubts arose regarding organizing anniversary celebrations, especially in the context of wide Railway Research Institute's international cooperation with research bodies, technical universities, and railway-related international organizations like the International Union of Railways UIC and the Organization for Cooperation of Railways OSJD.

Monographic publications for anniversary

Therefore we have focused on issuing monographic publications ensuring wide dissemination of our railway-related

knowledge and putting at the same time our logo with "70" on book covers as a substitute for celebrating our seventieth anniversary, i.e. three books in English: "Hazards in the Railroad Structures" (pp. 286, ISBN: 978-83-943246-3-6), "Overview of the key electromagnetic compatibility issues in high-speed rail direct-current traction operation" (pp. 200, ISBN: 978-83-943246-6-7) and "Railway safety, security and cybersecurity. Comprehensive approach to safety of the guided transport systems" (pp. 230, ISBN: 978-83-943246-7-4) as well as three books in Polish "The role of the Experimental Track of the Railway Research Institute in studying rolling stock and railway infrastructure" (pp. 334, ISBN: 978-83-943246-5-0), "Transformation of urban electric transport in Ukraine after 1991" (pp. 440, ISBN: 978-83-943246-8-1) and "Research for the development of rail transport. Young scientist of the Railway Research Institute in carrying out research projects" (pp. 284, ISBN: 978-83-943246-9-8).

Growing use of teleconference tools due to Covid 19

Pandemic circumstances resulted in the rapidly growing use of teleconference tools. Not only did we have to learn to use one chosen tool but to utilize different tools in different ways from simple online meetings via performing formal online audit processes up to organizing webinars for many participants.

Hybrid anniversary celebration to be organized

In December 2021, the Board of Directors decided to establish 70th Anniversary Scientific and Honorary Committee as well as 70th Anniversary Organising Committee undertaking urgent works on the preparation of the hybrid 70th anniversary conference. Pandemic restrictions were binding and difficult to predict especially in the longer perspective. However, it was obvious that the anniversary conference could be postponed for a year but not three, making the celebration nearly 75th. The exact date was open also due to legal restrictions applicable e.g. for hotels and meeting organizers. Moreover, it was decided that due to pandemic restrictions the celebration would be restricted to Polish participants only.

The decision to organize a hybrid 70th anniversary conference on the 15th of March was taken by Scientific and Honorary Committee on the 14th of January – two months in advance with a disclaimer that the date might be postponed due to pandemic restrictions or the number of persons invited personally might be restricted, putting emphasis on presence via online broadcasting.

Special military operation in neighbouring Ukraine

On the 24th of February military conflict broke out in a neighbouring country – Ukraine. Refugees started to come in hundreds of thousands mostly by rail transport. The political situation was changing and was expected to change significantly in a short period of time. The question, whether or not to organize the 70th anniversary was back. The decision to keep the date was taken by the Scientific and Honorary Committee on the 28th of February – two weeks in advance with a disclaimer, that the situation in Ukraine had to be reflected. The Board of Directors, taking into account the fact that the Railway Research Institute have cooperation agreement with Dnipro National University of Rail Transport teaching railway engineers at eastern Ukraine, requested his Magnificence the Rector to record a video to be shown during anniversary conference as the only foreign accent.

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200 participants at the conference, 300 online

The 70th anniversary conference took place on the 15th of March 2022. It was a long day as our intention was to show both a short view of our history and all our present key activities and competencies without causing an overnight stay of participants outside their places of living due to Covid 19 restrictions. As a result, 200 persons were present at the conference in Warsaw Marriott Hotel, while 300 persons were watching the anniversary conference online thanks to professionally provided broadcasting.

Jubilee ceremony session

The anniversary conference started with a jubilee ceremony session, which was led by a professional broadcast journalist Ms Beata Chmielowska-Olech and the Railway Research Institute Director Doctor Andrzej Massel. After welcoming multiple honorary guests, introductory speeches were given by Minister Andrzej Bittel - Secretary of State in the Polish Ministry of Infrastructure, Minister Ignacy Góra - President of the Office of Rail Transport (Polish National Safety Authority - NSA), Minister Tadeusz Ryś - Chairman of the State Commission on Railway Accident Investigation (Polish National Investigation Body - NIB), Professor Leszek Rafalski - Chairman of the Main Board of the Polish Research Institutes. The words of welcome were also expressed by representatives of science, railway and industry including: railway undertakings, infrastructure managers, rolling stock manufacturers, railway systems and devices producers and suppliers.

After the official welcome, the ceremony of awarding state and departmental distinctions and orders to distinguished employees of the Railway Research Institute took place. On behalf of the President of the Republic of Poland, the act of distinction was performed by the Secretary of State at the Chancellery of the President of the Republic of Poland, Minister Andrzej Dera. Moreover our employees were also presented with decoration awarded by the Minister of Infrastructure Andrzej Adamczyk.

After this grand time, guests were invited to pass anniversary greetings. Special words were handed over to the employees of the Railway Research Institute by many honorary guests, generally from Poland as due to Covid-19 pandemic restrictions international celebration idea was abandoned. An important exception was, however, made for the Rector of the Dnipro National University of Rail Transport whose short speech was shown on video together with Polish subtitles, taking into account that it was agreed by the members of the Scientific and Honorary Committee that anniversary conference should take into account the war situation in the neighbouring country Ukraine.

The jubilee ceremony session was closed by the presentation given by the Railway Research Institute Director Andrzej Massel dedicated to our Polish railway-related research history titled "Research for the needs of the Polish Railways - from the Experimental Department of the Ministry of Railways to the Railway Research Institute", which showed both main research activities and key researchers not only from May 1951 (creation of the Railway Scientific and Research Institute INBK), but also before as Experimental Department had been working since 1923.

Following three sessions were dedicated to present activities and competences of the Railway Research Institute, one session on infrastructure, one on rolling stock and one on materials', interfaces' and holistic issues important for both transport infrastructure and transport means.

Railway Research Institute infrastructure activities and competencies

The railroads as the basis for rail transport and improvement of organisation, traffic and management in rail transport were presented by the Head of the Railway Track and Operation Department. In relation to widely understood railroad focus was put on different types of activities starting from chosen topics like high speed turnouts tests, rails grinding support, rails surface quality checks, ballast stabilisation assessments via overall railway infrastructure verifications against binding European requirements defined by TSI INF and TSI PRM specifications up to unconventional guided transport systems' concepts including magnetic levitation and low pressure systems. In relation to organisation, traffic and management focus was placed on one side on strategic documents like elaboration of national strategies for implementation of operational rules defined by TSI OPE, TSI PRM and RINF regulation, CPK transport hub railway concept, overall network development perspectives up to the year 2050 and also on documents forming basis for decisions regarding individual investments like feasibility studies, and traffic demand analyses, as well as risk analyses and assessments. Moreover, the Railway Research Institute's involvement in the development of traction vehicle's simulators and their use in building and proving train drivers' skills were presented as an important separate field of activity.

The electric traction as a key component for maintaining low environmental impact of the railway transport was discussed by the Head of the Electric Power Department. Focus was put both on components and elements for instance rectifiers and circuit breakers as well as on overall verifications of power substations, overhead contact lines, and current return networks up to complete verifications of compliance with the European requirements defined by the TSI ENE specification. Traction energy storage devices tested within one of the development projects being conducted were also brought into focus.

The control command and signalling systems as a key component of active safety were presented by the Head of the Railway Traffic Control and Telecom Department. In relation to signalling focus was placed on scientific, research and competence building issues forming together active safety solid support proven both on components level and system level and being verified both by tests and by assessment of the safety cases. In relation to control command, not only was the focus put on ETCS European Train Control System which is checked after trackside and on-board implementations by tests and safety assessments but also on other communication based train control systems like mCBTC recently implemented and verified in Warsaw Metro. A dedicated ETCS test stand constructed on the Railway Research Institute test track was also presented. It is utilised not only to verify compliance of on-board control command installations with baseline 2 but also with baseline 3 specifications. The concept regarding space management improvement based on satellite navigation as well as the concept of the digital system providing data for emergency and rescue services were also discussed.

Railway Research Institute rolling stock activities and competencies

Although activities regarding control command on-board installations were shown together with trackside control command issues, all main topics regarding rolling stock were presented during a separate, dedicated session. First development of the railway rolling stock through improvement of functionality and safety was highlighted by the Head of the

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Rail Vehicles Department. Then testing of the railway vehicles as means of passenger-friendly transport and as means adjusted to various functions and types of cargo was presented by the Deputy Head of the Rolling Stock Testing Laboratory. Then the Test Track Centre near Żmigród as a key research infrastructure was unveiled by the Manager of the Test Track Centre. In relation to the rolling stock development, national, European, and international legal terms and requirements were brought into focus. Overall verification of vehicles against TSI legal and technical requirements was shown including examples of passenger coaches, electrical multiple units, as well as special vehicles - grinding, tamping, and auxiliary rail-road machines.

The second presentation was dedicated to vehicle testing capabilities including functional aspects, environmental aspects e.g. noise and vibrations, and safety aspects e.g. braking, dynamic behaviour on twisted track, equivalent conicity, derailment, running on S-curves, crashworthiness. The session was closed by presenting the test track near Żmigród. This is a nearly eight-kilometre track loop constructed 25 years ago which was designed for comparative verifications of track components e.g. sleepers from different producers and different materials, but presently used mainly but not only for rolling stock tests. The focus was put on different types of vehicles which were tested, as well as the number of tests performed. The presentation was ended with test track development plans.

Railway Research Institute materials, interfaces and holistic issues important for both transport infrastructure and transport means

The research on materials and structural elements used in rolling stock and railway infrastructure was presented by the Head of the Materials and Structure Laboratory. In relation to the tests of rolling stock and rolling stock components attention was drawn to bogie frames, couplers, and axles. Information was given regarding training courses for maintenance personnel performing non-destructive tests. Several slides were dedicated to our involvement in the development of fire safety requirements and fire safety proving capabilities from acceptance of materials and devices via acceptance of fire-fighting systems up to acceptance of vehicles from the fire safety point of view. Short info was provided regarding corrosion protection testing. In relation to the tests of infrastructure components, the interest was focused on sleepers, fastening systems, rails, rails' weldings' testing taking into account macro- and micro-structure analyses, and fatigue tests as well as the overhead contact line supporting structures and counterweights utilized for tightening overhead contact lines, wooden crossing timbers, as well as chemicals used to keep tracks free of flora. Tests and technical analyses which are prepared following accidents on request of investigation bodies were also presented on a few slides showing both the use of the test stands and the use of FEM simulations as well. The presentation was completed with an overview of competences and plans.

The wired and wireless communication as the basis for the efficient implementation of transport processes was presented by the Head of the Signalling and Telecommunication Laboratory, who focused on tests reflecting operational circumstances including ambient environment, electro-magnetic compatibility, electrical safety, radio parameters verifications, and functional verifications. Institute involvement in the research projects and development plans were also presented.

The conformity assessment of interoperable subsystems and interoperability constituents as the basis for ensuring interoperability while maintaining the functionality and safety of rail transport was outlined by the Head of the Quality and Certification Centre. It was started from the European interoperability concept to go to legally required and optional assessments as well as European and complementary national requirements showing documents defining requirements, documents defining assessment procedures and types of documents proving conformity.

Finally, the holistic and multi-aspect safety analyses, as a key component of traffic safety, transport safety, and cyber security, was presented by the author of this information. Starting from the definitions of safety, risks and hazards it went via time and space distribution of safety aspects and binding safety methods defined by regulations under EU Railway Safety Directive to risk acceptance methodology defined by CSM RA regulation. In relation to risk acceptance focus was drawn to different ways to ensure completeness of safety analyses as well as cooperation between railway undertakings and infrastructure managers as railway duty holders performing risk assessment on functional level and railway industries providing technical hazard control as well as assessment of safety cases on the basis of random and systematic safety integrity levels showing all three fail-safety types of systems architectures. It was completed with an overview of the digital functionalities which were identified regarding safety and security digital domains of the railway system which should be protected by identified sixteen types of cybersecurity protection functionalities. The final slide was dedicated to the "cybersecurity guidelines for the employees of the railway entities".



Photo: IK

Photo 2. Decorated Railway Research Institute employees

Conference closing

The Conference was closed by Railway Research Institute Director. The closing remarks were also given by broadcast journalist, who was leading the jubilee ceremony session and supporting session chairmen respectively Deputy Director chairing infrastructure session, Institute's Scientific Council Chairman chairing rolling stock session, and Railway Research Institute Director chairing the final session.

Scientific, technical, operational challenges in related discussions took place just after and involved all the guests present personally. It is important to mention that all our employees were invited to participate on site, but some have chosen to participate via teleconference tools.

We would like to thank all the participants of the conference for their congratulations and participation in the conference.

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First Battery-Powered Shunting Locomotive Produced in Poland

Andrzej Chojnacki

Engineering and research specialist, Rolling Stock Testing Laboratory, Railway Research Institute



As part of the implementation of project No. POIR.01.01.02-00-0049/15 co-funded by the European Regional Development Fund under Measure 1.1 R&D Projects of Enterprises, Sub-measure 1.1.2 R&D works related to the creation of a pilot/demonstration installation of the Smart Growth Operational Programme 2014-2020, Zarmen has designed and manufactured a prototype of an innovative autonomous rail vehicle for shunting on marshal-

ling sidings belonging to enterprises and in hazardous areas. The vehicle is also referred to as an MLK type locomotive.

Innovative solutions not found in other types of rail vehicles are applied in this autonomous rail vehicle. Thus, acid batteries are used to power the vehicle, which allow for free shunting operation for min. 8 hours on a single battery charge with a dedicated external charger. The innovative method of assembling the batteries on the outside of the enables a quick replacement of complete batteries and a new set insertion, which significantly reduces the operation breaks connected with the need to charge the batteries. The vehicle does not have combustion engines which would emit exhaust fumes into the environment - thus it is environmentally friendly. Another innovative solution used in the vehicle is the possibility of lateral movement of the locomotive using caterpillars (crawler tracks) installed on both ends of the locomotive. In order to do this, a hydraulic system lowers both crawler tracks to ground level and then raises the locomotive above the rail heads. The locomotive is moved laterally by means of tracks driven by hydraulic motors. Once on the other track, the locomotive wheels are placed on the rails and the tracks are raised to the transport position. The introduction of this system considerably reduces the time spent shunting the locomotive itself.

The autonomous rail vehicle with Bo-Bo axle arrangement is intended primarily for medium and light shunting operations on rail sidings belonging to enterprises and in hazardous areas. In special cases, it can shunt a full train of wagons of total weight of 2 400 t. The locomotive is adapted to operate on tracks of 1,435 mm gauge.

The locomotive body consists of two driver's cabs, designated 'A' and 'B' respectively, enabling the driver to have a full view when operating from one or the other active cab, and of the engine compartment. Each driver's cab is accessible from both sides of the vehicle through an external door. The inner door allows access from one cab to the other via the engine compartment. At the ends of the vehicle there are service platforms and steps for shunters. The locomotive body is a steel construction. A ribbed structure and reinforced plating have been used as the vehicle superstructure.

MLK type locomotive is equipped with 2 two-axle bogies with individual drive of each axle. The bogie spring suspension consists of a system of spiral springs, metal-rubber pads and vertical dampers.

The secondary spring suspension system between the locomotive frame and the bogie frame consists of coil spring packs (a smaller spring inside a larger one) together with metal and rubber pads and vertical and transverse dampers.

Due to the purpose of the MLK type locomotive, the placing in service is carried out basing on the Regulation of the Minister of Infrastructure and Development on the placing in service of certain types of structures, devices and railway vehicles (Journal of Laws of 30 May 2014, item 720).

The Railway Research Institute conducted tests of MLK type locomotive for conformity with the requirements of the regulation. On the basis of performed tests and submitted technical documentation, a technical opinion and a certificate of conformity of type were issued. On the basis of the documents mentioned above, the Railway Transport Office issued a certificate of placing in service for a limited period of time. At present, during the validity period of the Certificate, in accordance with the regulation, operational tests of the locomotive type MLK are conducted by the Institute. After positive completion of the tests, IK will again draw up a technical opinion and a conformity certificate of a type. These documents will allow the Railway Transport Office to issue an indefinite Certificate of placing in service of a type of railway vehicle.



Photo: IK



Photo: IK

Photo 1. MLK type locomotive on the premises of the Railway Research Institute in Warsaw

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Planned Changes to the PRM TSI Relating to Accessibility of Rolling Stock for Persons with Disabilities and Persons with Reduced Mobility

Marceli Lalik

Senior Specialist, Rail Vehicles Department, Railway Research Institute



As part of the revision of the Technical Specifications for Interoperability (TSIs) and other documents related to the interoperability of the rail system in the European Union, the European Union Agency for Railways (ERA) conducted a public consultation from 18.03.2022 to 17.06.2022 as part of a package of changes called "Digital Rail and Green Freight". The consultation also covered the Technical Specification for Interoperability relating to the accessibility of the European Union railway system for persons with disabilities and persons with reduced mobility (TSI PRM - EU Commission Regulation No 1300/2014). The planned changes to the TSI PRM are contained in the documents: TSI revision 2022 - Digital Rail and Green Freight - Changes proposed to the chapter 7 of the TSI PRM, Recommendation ERA-REC-128-2 - Proposal for the revision of the Annex to Regulation (EU) 1300/2014, Working Draft - TSI relating to accessibility for persons with disabilities and persons with reduced mobility.



Annexes (Appendices) of the PRM TSI

In terms of the layout of the PRM TSI content, the significant change is the addition of a new Appendix "P", describing the changes to the requirements and transitional rules and the deletion of seven Appendices of the TSI, replacing in most cases their content by the requirements of normative documents.

Normative documents

In addition to the usual updating of editions of normative documents, some previously used standards have been replaced by normative documents dedicated to railways. Moreover, new standards have been introduced which are not only related to railways but which address the subject of accessibility of rolling stock for persons with disabilities and persons with reduced mobility. Among others, the new standards in the PRM TSI will be the European standards EN 16584-1:2017 (Railway applications - Design for PRM use - General requirements - Part 1 Contrast), EN 16584-2:2017 (Part 2 Information), EN 16585-1:2017 (Design for PRM use - Equipment and components on-board rolling stock - Part 1: Toilets), EN 16585-2:2017 (Part 2: Elements for sitting, standing and moving) and EN 16585-3:2017 (Part 3 Clearways and internal doors). Thus, these standards will become mandatory for use within the scope defined by the PRM TSI.

Wheelchair parking space and priority seats

Concerning the wheelchair space areas, the prohibition on placing any equipment in the space has been clarified and the

location of the call for aid device has been linked to the requirements of EN 16585-1. With regard to the marking of priority seating adjacent to seats and on the outside of wagons, this will no longer be mandatory for vehicles intended to be operated exclusively within a seat reservation system.

Exterior doors

In the area of vehicle entrance doors, the update of the technical requirements includes, among others:

- the opportunity to omitted the audible door opening signal for persons outside the train, when an additional, different and new in the PRM TSI, door finding signal is provided, the characteristics of which are described in clause G.2,
- the possibility to skip the door closure warning signal when the door closes for reasons other than departure and if there are alternative means to reduce the risk of injury to passengers and train crew,
- complementary requirements for the visual warning signal, which shall additionally comply with EN 16584-2.

Contrast

An essential change is also the obligation to assess the contrast of rolling stock elements against the surrounding surface according to Clause A.1. of EN 16584-1:2017.

Interoperability constituents

With regard to the interoperability constituents, i.e. the vehicle elements separated from the subsystem and for which the manufacturer draws up an EC Declaration of Conformity, the technical requirements for the component 'internal and external displays' have been moved to the subsystem level for assessment, and the displays will no longer be an interoperability constituent.

On the other hand, the change of requirements for the constituent "call for aid device" limits the possibility of using colour signage for this component to a black symbol on a yellow background.

Operating rules

As far as operational rules are concerned, which the Railway Undertaking is responsible for during vehicle operation, provisions have been added in two areas, i.e.:

- lighting: it is permissible to reduce the level of lighting in a vehicle if each passenger seat is fitted with individual lighting,
- on-board services provided on the train: if a service is provided to passengers on the train, it must also be accessible to wheelchair users.

Other changes

Other changes planned to be introduced in the next update of the PRM TSI are related to formal issues and design documentation and include: a clearer link between the implementation of the PRM TSI and the provisions in the LOC&PAS TSI, the addition of several 'interfaces' with the LOC&PAS TSI subsystem, the definition of an 'interoperable wheelchair transported by train' and the introduction of a second 'theoretical platform' dimensional pair in the vehicle technical documentation.

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