

Editorial



The policy for separation of the accounts of train operating companies and infrastructure managers brought a lot of positives for railway transportation but in the same time a lot of problems for the companies who decided to choose full separation of the activities have arisen, because the systematic approach of the railway system has been transformed. This transformation directly affects the quality of services offered by the railways and ultimately satisfaction (speaking bluntly - dissatisfaction) of the customers. After years of much experience it became clear that the railway should be run as a system in order to have proper maintenance of the infrastructure and smooth operation of the train operating companies. Adding to that the intensive "brain drain" and the aging of staff in the railway companies and infrastructure managers, it is understandable (unfortunately in a hard way) that in the railway sector the systematic approach and thinking, which cover the entire process – from the initial planning stage to the final stage of operation, typical for other leading industries (for example, aviation, defence), is a must. Therefore, the phrase "systematic railway engineering" (which until recently sounded somewhat alien and strange for the railways) has been taken as warning signal and its practical implementation has become a strategic goal of the UEEIV. The ultimate goal is the recovery of the systematic advantages of railway transport in modal competition, as well as the recovery of its image and attractiveness for the customers.

The key is hidden in the simple and understandable goals to be performed by the railways: keeping the customer in the spotlight, improving the quality of services and performance of the timetable. Today we are speaking and working hard for the establishment of a Single European Railway Area. The European railway systems need as much as possible the harmonization of operational rules and coordination of the temporary capacity restrictions; we even are talking about a Single European Infrastructure Manager. TEN-T Corridors and Rail Freight Corridors are the backbone in this area. The Fourth Railway Package paves the way for the railway revolution in Europe. The national railway systems should rapidly take measures for adaptation in the new situation and meet the requirements and challenges of modern times. In my opinion, the change will occur when the stakeholders understand that each national railway is part of that Single European railway area and that a systematic engineering approach should be adopted without any other alternative.

Topics:

December 2019

- Editorial
- From the Presidium
- ÖVG-Forum: Systems Engineering – Overcoming Interfaces
- 45th Graz Conference on Modern Rolling Stock
- 1st D-A-CH Congress: Growing Flows of Traffic – A Way Out Through New Technologies?
- 5th International Conference: Modern Turnout Technology
- Track to the Future - 3rd VDEI Congress on Rail Infrastructure Works
- INFRATRANS@: The latest challenges and problems of the railway sector in Romania
- Training on the maintenance of freight wagons in Bulgaria
- 22nd International ÖVG Convention: Optimising the Wheel/Rail System
- CIFI Seminar: Training - cost or investment?
- ASPECT: Trends in the signalling sector
- 3rd PWI Seminar: Design & Construction Challenges from Theory to Operation
- ŽID Round Table: Profiling systems engineering as a matrix of the railway system
- NGS RTE Conference: European Railway area – challenges and opportunities
- PWI practical track work challenge for young engineers
- VDEI celebrates its 70th Anniversary
- Young Rail Professionals Network VDEI: Excursion
- SITK's Friendly Visit to VDEI
- Calendar of Events 2020

In this respect, the UEEIV plays an important role having a broad experience with the systematic engineering approach and the practical application of this scientific methodology, from one hand, after the separation of the incumbent railway companies and interruption of many systematic links, UEEIV is uniting working and developing railway engineering associations with real experts in all railway specialties. It is the only professional organisation that plays the role of "a storage bank" for systematic knowledge and experience for railway systems engineering and an integrator of scientific and practical experience in Eastern and Western Europe. On the other hand, UEEIV has the advantage and the opportunity to benefit from the mission to spread the knowledge of railway engineering associations by helping European railway engineers to broaden their understanding of railway systems engineering and to join the networks of professionals (both renowned experts and young professionals). This potential should be used as much as possible. Among the members of the UEEIV (there is no doubt) grow leaders who will be able to lead European railways to a new, more intensive path of development.

Primary systematic rule is that united we are stronger

Ass.Prof.Dr.Ing. Mario Galabov, Vice President

From the Presidium

Priority topics discussed at the meetings

The Presidium met four times in 2019.

Railway Systems Engineering

- Support to member organisations in preparing and conducting technical seminars:
 - ÖVG, Forum in Graz and Seminar in Vienna
 - ŽID, Round Table in Novi Sad/RS
 - CIFI, Expo Ferroviaria in Milan/IT
- Convocation of a working group to prepare Railway Systems Engineering Certification under the leadership of Knoll and Wermelinger.
- Consultation with IRSE on the joint organisation of a seminar.
- 2-year master course in Mobility Engineering at the Politecnico di Milano/IT, launched in October 2019.

EURAIL-ING Certification

- Grad. Eng. **Olaf Scholtz-Knobloch**, VDEI, is the new Head of the Staff Certification Body (SCB). He is supported by Grad. Eng. Bernd Gruhn and Claudia Hassenzahl.
- ŽID will establish a certification office in Serbia.

UNION REPORT 2020

- For financial reasons the REPORT will be published in English only (print and electronic version) as of 2021 and supplemented, where required, by reports submitted to the editors in German.

Seminars of member organisations

- The budgets for 2020 have been adopted and contacts to the speakers and sponsors established:
 - ÖVG Vienna in January
 - CIFI Milan in May
 - NGSRT Albena/Bulgaria in June
 - PWI Manchester in October

European Network of “Young Engineers”

- The network was successfully launched on the occasion of the D-A-CH conference in Dornbirn/A. Financial support was provided for the participation of 10 young engineers.

- The same applies to young entrepreneurs taking part in the next Systems Engineering seminar in Vienna.

Board of Advisors

- Heijnen and Kehr are very active in reviving such a board. Wermelinger and Cholewa have established appropriate personal contacts in their countries.
- Johann Dumser (Plasser&Theurer) and Detlef Suchanek (PMC Rail) have already promised to participate.

General Assembly 2020

- on 4 June 2020 in Albena/BG in conjunction with a seminar the following day.

Member Organisations and Supporting Members

- UEEIV currently has 14 member organisations and 17 supporting members. Five supporting members have announced the forthcoming withdrawal of their financial support. Consequently, income expected for the 2020 budget is reduced by up to EUR 10,000. Nevertheless, the UEEIV's financial situation is good.
- Galabov, supported by ŽID, is active in establishing an Association of Macedonian Railway Engineers to become a future member organisation of UEEIV.
- Similar efforts are being undertaken in Luxembourg.
- Wirth will approach Stadler Rail, Heijnen and Spoors will approach IRSE, and Wermelinger will approach the Swiss South-East Railway (Südostbahn SOB) to request their participation as supporting members.

Cooperation with PMC Rail

- UEEIV is a cooperation partner and potential certification body.

In a minute of silence, Heijnen honoured the extraordinary achievements of the deceased Head of the Staff Certification Body, Grad. Eng. Wilfried Lorenz.

Dr.-Ing. Bernd Neumann, VDEI



Cholewa, Neumann, Vukmirovic,

Brogliä, Wermelinger, Kehr, Wirth,

Kaufmann, Heijnen, Barbu,

Galabov, Spoors, Knoll

Forum "Systems Engineering – Overcoming Interfaces"

UEEIV and ÖVG addressed the topic of "Systems Engineering"

The venerable assembly hall of the Graz University of Technology was well attended at the ÖVG Forum in January 2019 organised by the Austrian Society for Traffic and Transport Science (ÖVG) and UEEIV.

In his opening address, UEEIV President **Frans Heijnen** stressed that railways were an entire system and not just a system of parts. Nowadays, however, decision-makers frequently lacked this holistic view of the system. The host, Prof. Dr. **Peter Veit**, Head of the Institute for Railway Engineering and Transport Economics of the Graz University of Technology, explained in his words of welcome that an interface signified the place where the responsibility of one organisation had "already ended" and that of the other organisation had "not yet begun". Expertise and an understanding of the system were required to overcome interfaces. Both expertise and understanding were in ample supply, since the organisers had invited qualified experts from the most diverse railway disciplines to speak at the forum.

Buzzword: Basic Interval Timetable (BIT). A change of perception had taken place in how to look at the system: timetable first to be followed by operational planning and track work. A tangible example was presented by **Harald Buschbacher** and **Samuel Niemand**, both Schig mbH, as well as by Dr. **Stefan Walter**, in charge of this project in the Styrian regional government. They had developed an integrated BIT for their home region in seven steps within 18 months. Based on strategic infrastructure planning, they had established a node-edge model to devise the priority long-distance service Vienna – Graz – Venice and the Interregio long-distance service within Austria. Then they had added short-distance and local bus service. Finally, this construct was aligned iteratively with the Styrian infrastructure and the necessary track work identified. This had resulted in a convincingly dense and ideally dovetailed variety of transport choices.

Dietmar Zierl, the ÖBB's infrastructure specialist and project manager responsible for the entire coordination of the Brenner Base Tunnel (BBT), reported on novel system approaches. According to his experience, complexity grew with the number of elements and linkages. Consequently, complex systems were hard to assess and their course almost impossible to predict. To make his point, Zierl showed the loop of investment, operation and maintenance. No matter which asset, he would always ask: what is it for and what is its impact on the entire system? His goal: keep it simple. Another of his lessons from decades of experience: assets that can do everything are uneconomic.

Frans Heijnen reported on the Eulynk Project, an interface to standardise optimal control technology for railways. A highly complex development process resulted in the formulation of technical requirements for control and safety technology, thus creating the preconditions for the harmonisation of signalling technology throughout Europe. But how to address the important question of remaining uncertainties? There were quite a number of them given the 17,000 pages of paper detailing all specifications. Eulynk uses a dynamic test procedure consisting of functions, use cases, modelling and validation. And the result? The models work. As Heijnen stated: "Systems Engineering returns to the railways."

Prof. Dr. **Peter Veit** focused on Life Cycle Management for infrastructure. How long would maintenance make sense, when would re-investment become appropriate? To take these decisions, data are necessary and in particular solid analyses and suitable parameters. One must distinguish between service life for technical, economic and accounting purposes. The perfect point in time for re-investment is "exactly at the transition from decreasing depreciation and increasing maintenance".

Following up on Dietmar Zierl's presentation, the tunnel specialist Dr. **Walter Eckbauer** discussed infrastructure and maintenance. Unlike the VDE 8 tunnel section between Erfurt and Bamberg (one tube) and the Gotthard Base Tunnel (two tubes), three tubes with a total length of 230 km are to be drilled through the Alps for the Brenner Base Tunnel. This is due to the realisation that high availability could only be ensured with maintenance being provided over a third supply tunnel where the key parts of all the technical installations would be placed so that maintenance and repair could be carried out independently from rail service.

The classical "wheel-on-rail" topic provided interesting system insights, too. As Dr. **Stefan Marschnig** of the Graz University of Technology explained, pricing policies for track access charges would have to distinguish between basic charges, market surcharges and incentive systems. The simple formula: track-friendly rolling stock would pay less, destructive rolling stock pay more. Incentive systems would also be effective in noise protection. Similar arguments were used by Dr. **Markus Giger** from the Swiss Federal Transport Authority. His approach: natural interfaces (clearance envelope) need not be managed. Absolute targets for interfaces, as defined in the TSIs, require rules. Relative interfaces (noise, wear) should be achieved by incentives.

Judith Engel broached the subject of Systems Engineering in more general terms, but based on actual project experience. As the responsible project manager, she had managed the design and construction of the Vienna Main Railway Station between 2005 and 2017. Her conclusion: large construction projects were generally characterised by great complexity and a huge variety of necessary disciplines. However, these areas would not only result in interfaces but also in trade-offs. According to her, project management meant working with people. And people do not act inconsequently. "Successful project management, first and foremost, is about achieving cooperation."

Matthias Lehmann, Team Leader of Conceptual Construction Work Scheduling at DB Netz AG, concluded the

meeting with a report on optimised rail service and track work, where currently a paradigm shift took place away from an application-driven and bottom-up approach towards a clocked customer-based top-down regime. For this purpose, DB Netz had established a complex capacity management system composed of 217 corridors and 15 junctions. Those managing track work scheduling would now use five levers: pool track work on corridors, allocate clocked track possession windows, ensure supra-regional optimisation of the track work programme, shorten work-induced track possessions and provide additional infrastructure such as cross-over switches and block signals. This, too, a major effort of cooperation.

Achim Kühne-Henrichs, VDEI Service GmbH

45th Graz Conference on Modern Rolling Stock

Railways in the Age of 4.0: Trends, Innovations, Opportunities

I am pleased to report on the conference held at the Graz University of Technology from 14 to 17 April 2019.



Despite the unusual date in Holy Week before Easter, we achieved a record attendance of 664 registered participants. The conference again brought together producers and operators of rolling stock with representatives of the research community. 35 presentations were made during the 2½ session days.

Prof. Dr. **Sabina Jeschke**, Board Member for Digitalisation and Technology of Deutsche Bahn AG, had been invited to discuss the trends, innovations and opportunities of railways and thus introduce the topic of conference.

The thematic blocks of this year's programme included the presentation of new railway vehicles and their approval, with innovative freight wagons rounding off this block on rolling stock. Since the railway system is determined by the interaction of rolling stock and infrastructure, the topic of wheel-on-rail contact was given much scope. The public opinion that autonomous driving was a field of innovation exclusive to road transport was countered by reports on current research and the implementation of Automatic Train Control (ATO). Issues of maintenance as well as all

questions concerning the life cycle costs of railway vehicles, their energy requirements and modernisation are increasingly moving to the fore.

Dr. **Elisabeth Oberzaucher** had been invited to the traditional science evening. Her topic was: "If only there were no passengers – ethological considerations of railway vehicles".



The aim of the Graz conference is to strengthen innovations in the rail sector and support their implementation. Our contribution is to provide a suitable environment, invite speakers to foster the exchange of experience and discussions and, in so doing, prompt further innovations. It is within this sense that I want to invite you to the next Graz conference, which will take place from 6 to 9 September 2020, and call upon you to help devise its programme by submitting numerous papers.

www.schienefahrzeugtagung.at/programm-2/

Prof. Dipl.-Ing. Dr. techn. Peter Veit, ÖVG

The 5th International Conference on Modern Turnout Technology

Reliable and safe design, including economic and environmental issues of modern turnouts were addressed during one day conference in Poland

This was the 5th time the UEEIV together with Polish Association of Transport Engineers and Technicians (SITK) had organised a common conference on modern technologies in the design and maintenance of railway turnouts. This year the event took place in Bydgoszcz Hotel Holiday Inn on May 17th.

The turnout is one of the most critical sub-systems which has significant impact on reliability and safety of whole railway system. The reliability and maintainability of the railway turnout is also important from the railway customers perspective as far as punctuality is concerned. However a modern turnout integrated with a switch machine is not only a part of the railway but also a part of the signalling system, just as turnout heating is a part of the energy system. Some suppliers started to install diagnostics devices together with their turnout to enable predictive maintenance and in order to reduce downtime. This creates a more and more complex situation. Thus the objective of the conference was to share experiences across countries and finally to elaborate conclusions that could be utilized in the future development process aimed at improvement of technical and operative parameters of turnouts.



The conference was opened by the UEEIV Vice President Dr. **Bernhard Knoll** and Dr. **Andrzej Cholewa** on behalf of SITK. In the conference more than 70 participants took part from Austria and Poland. During the conference day

more than 20 speeches were given by the representatives of railway suppliers, infrastructure managers, institutes and universities. The speakers addressed the most modern

achievements in the fields of technology, operation, research and development and testing. Environmental issues were also addressed. Several presentations were devoted to cost analysis, cost optimisation including life cycle costs. The consensus between investment expenditures, maintenance costs to reach the proper level of reliability and safety is getting more and more critical versus higher speeds and loads if European railways shall be competitive compared with other transport modes. Observing discussions and listening to the speeches one can draw conclusions that all members of the supply chain, beginning with R&D departments, university labs, institutes, manufacturers and customers – railways - not only infrastructure managers but also operators, they all have an influence on quality of turnouts.

All four turnout producers having manufacturing plants in Poland were actively present during the conference: Vossloh Cogifer, KZN Biezanow, Track Tec and VAE.

Important feedback to the industry was made by the ÖBB, represented by Dr. **Bernhard Knoll** and the PKP PLK by **Dariusz Korab**.

The key conclusion from the Bydgoszcz conference was that turnouts should be in focus of the whole railway industry. Furthermore, turnouts should be treated as a system not as a sum of elements for which different, rarely coordinated departments of the infrastructure manager are looking for. The future improvement and objectives will be only achieved if all, to whom it concerns, will work to the same target – turnout quality.

Dr.-Ing. Andrzej Cholewa, SITK

Track to the Future - 3rd iaf Congress on Rail Infrastructure Works

New construction and upgrading programmes of the D-A-CH countries for rail infrastructure and its digitised planning

An amusing question at the VDEI's iaf Congress 2019. The panel moderated by **Dirk Flege**, Managing Director of Allianz pro Schiene e.V. (ApS), brought together the network managers of the D-A-CH countries: **Frank Sennhenn** of DB Netz AG, Dr. **Hubert Hager** of ÖBB Infrastruktur AG and **Andreas Brunner** of SBB Infrastruktur. Flege asked the managers with whom of the

other two they would like to swap places. Hager would opt for Germany. The great challenge in such a large country would be to render the customer focus more tangible to all taxpayers and railway passengers. Since he already knew how to deal with tunnels and mountains, Brunner, too, would like to slip into Sennhenn's skin. Sennhenn, for his part, would swap places with his Swiss counterpart. The

simple reason: for once in his life he would like to attend a social gathering without being immediately told stories about flaws in the railway.

But, of course, there was also a serious discussion. **Flège**, for instance, stressed right at the beginning of his keynote address that EUR 1.6bn per year were not enough to build new rail infrastructure and upgrade the existing one as defined by Germany's Federal Transport Plan (priority projects). In the opinion of ApS, twice as much would be needed to ensure even remotely realistic funding.

Where should the money come from? Placing his finger on the wound, he claimed that the problem lay in the legal framework within which the "road finances the road". Up until recently, this had not really been a problem. However, since the lorry toll system now also applied to main roads (Bundesstraßen), the funds available for trunk roads had virtually exploded. Between 2017 and 2019, they had increased by 45% whereas railway funds had grown by a mere 4% over the same period. This made it impossible to implement transport policy objectives, according to Flège. Unlike Germany, Switzerland's policy was based on the tenet "transport finances transport".

The network managers agreed that much was still to be done for and thus invested in rail infrastructure. Sennhenn identified obvious capacity bottlenecks for Germany, with train kilometres having risen from 450 million in 1990 to 650 million today. DB Netz was to tackle four major challenges by 2025: expand digital rail service in Germany, ensure capacity conservation and central track work control, optimise track work processes, and reduce service interruptions.

Austria, too, presented an extension programme called "Masterplan 2025 plus". **Hager** listed four major challenges:

- Operational excellence, safety and punctuality
- Competitive strength and economic efficiency
- Generation change and corporate culture
- Innovation and digitalisation

Every year, some EUR 2.4bn are invested into the rail network in Austria, the focus now being on the Vienna-Graz section which, together with the Semmering Base Tunnel, is expected to shorten travel time by 30 minutes. "This is definitely faster than by car", Hager said.

Switzerland controls investment in the railway system by FABI (German acronym for "infrastructure financing and expansion"). Finances are secured for a long term and provided by the railway infrastructure fund, which is fed by several sources. Nevertheless, much is still to be done in the railway paradise Switzerland. Work on capacity increases in stations and trains is to be initiated by 2025. In the long term, half-hour interval timetables should be introduced on all main lines throughout the country. Heavily frequented lines already offer 15-minute intervals. The objective is to increase commercial speed rather than running speed.

Comparison between European countries was continued after the lunch break with a number of examples. In Belgium, the network manager Infrabel has gathered excellent experience with digital applications for modern track maintenance. This requires managing huge amounts of data to be able to draw tangible conclusions. However, the effort pays off: district inspectors are more and more being alerted to smaller flaws early on, thus facilitating repair and maintenance work.

An interesting report was presented from Germany on the design of the new line Hanau – Fulda. Using digital 3-D design and appropriate modelling, planning engineers were able to explore more than 1,000 variants within a search area of 30 x 50 km. In the end, the most favourable route could be defined based on environmental and regional planning criteria as well as on transport and economic aspects. Regional development is planned very transparently in an early phase of the process, thus having a positive impact on public perception.

Overall planning, design and construction can no longer do without digitalisation. Rather, construction projects need to generate a digital twin as a basis for modern infrastructure planning. To this end, existing lines are mapped by most advanced track recording cars to produce a consistent data model as a basis for BIM-compliant design.

With other expert contributions on "Generation change and knowledge transfer" or "Innovation and current research" and technical demonstrations in the outdoor area, this congress organised by VDEI Service GmbH illustrated once again the importance and value of an exchange of expertise across national borders.

Achim Kühne-Henrichs, VDEI Service GmbH

1st D-A-CH Congress: Growing Flows of Traffic – A Way Out Through New Technologies?

Congress on the Development of Transport Modes and Technologies in this Field

In the 1980s, the German, Austrian and Swiss societies for traffic and transport science organised D-A-CH congresses on current transport topics every two years. Towards the turn of the millennium, these congresses petered out with the European perspective being prioritised and mainly European meetings being organised. The Austrian (ÖVG), German (DVWG) and Swiss (SVWG) national associations now made the attempt to revive these meetings for the German-speaking area with a congress on 25/26 April 2019 in Dornbirn/Austria.

During its preparation, the European Platform of Transport Sciences (EPTS) and the Swiss Society of Engineers (GdI) came on board. Finally, the UEEIV Presidium decided to participate in and support these congresses. A total of six organisations ended up assuming the patronage and compiling an interesting programme.



Right from the beginning of the conference its title was questioned in the first presentation by Univ. Prof. Grad. Eng. **Klaus J. Beckmann**. He called for clarification of whether the growth of traffic flows was an inevitable fact. In his opinion, innovations were often presented too positively ignoring their side effects. Prof. Beckmann saw it as a major task of science and research to shed more light on these correlations, thus directing the political and social debate towards actual problems. To him it was obvious that new technologies would not be able to manage traffic flows in a sustainable manner.

Frank Bruns, Grad. Economist, discussed a study on the effects of automated driving. True, the study stated that by reducing the headways between vehicles it would be possible to increase the capacity of the existing infrastructure. However, since such systems would also enable new groups to access motorised private transport and produce additional empty journeys, this effect would be more than compensated by growing demand. This not only applies to

passenger transport but also to freight transport where demand would greatly increase once goods can be delivered unattended.

The only chance of containing transport growth would lie in enhanced ride sharing both in passenger and freight transport. In real terms, however, there would be the risk that these new forms of transport offered would result in even greater distances between home and work being accepted and, consequently, in additional transport volumes being generated.

Afterwards UEEIV was given the opportunity to introduce itself briefly and present its sponsorship of five young engineers who participated in this event.



As members of the youth organisations of the engineers' organisations, each of them received EUR 100 as a contribution towards the cost of participation.

Wolfgang Köstinger, business graduate, followed with a presentation on how the loading capacity of piggyback services (Rolling Road) was to be increased on the Brenner. They were to be upgraded in several stages so that up to 50% of current lorry transport along the Brenner route could be shifted onto the Rolling Road within the medium term. Concepts had to be developed to effectively ease the burden on this critical route. Implementation would depend on the framework conditions provided by transport policies.

The first day was concluded with a panel discussion led by Dr. **Veronika Kessler** with Dr. **Florian Krummheurer**, Univ. Prof. Grad. Eng. Dr. **Norbert Ostermann**, Dr. Eng. **Thomas Sauter-Servaes**, Grad. Eng. **Johannes Kehrer** und Univ. Prof. Grad. Eng. **Gerd Sammer**.

It soon became clear that we would need a radical rethink if the world's climate objectives were to be attained. In particular, ways and means of reducing traffic flows were to be sought. This could only be done in cooperation with policy-makers who, however, could not be expected to provide any ready-made solutions. Transport experts must highlight cause and effect and develop possible solutions. The panellists doubted that any market-driven development could reach these goals as it would always focus on efficiency and cost reduction and, accordingly, generate

greater traffic volumes. Hence a paradigm shift should be aimed in order to move new technologies and improved sustainability centre-stage.

The second day began with a presentation by Prof. Grad. Eng. **Francesco Cormann** on disruptions of railway services, with Rastatt in the Rhine Valley being used as an example for the various effects. He reported that a service disruption in this part of Switzerland had resulted in fewer train delays than before both in the local Basel network and the Olten and Zurich junctions. This was due to the fact that the DB and SBB networks had not been linked up during this time. He stressed that freight transport in particular had to use long-range alternative routes subject to other technical limits to be communicated to the hauliers. In general, one must admit that in such situations operations control was under much greater pressure owing to the many RUs using the network. This could only be partially compensated by new IT systems.

In cooperation with the major railways, new digitised systems were to be established for the Swiss rail sector. El. Business Manger **Ivo Norbert Abrach** introduced a package of sub-programmes for the traffic management system, for electronic signal boxes, for localisation, for a mobile vehicle platform and for automated rail service.

Its main focus would be on the continuous development of systems in order to ensure ongoing operation within the network. To this end, assistance systems were to be introduced in the first instance.

The objectives to be achieved by 2040 include: reduce cost of rail service, improve efficiency, safety and availability, and increase the capacity of the railway network.

With 120 participants, the congress was very well attended and offered a plethora of information. The next one is to take place in two years.

Grad. Eng. Roland Wermelinger, Gdl

INFRATRANS® - one of the leading railway exhibitions in Eastern Europe

The latest challenges and problems of the railway sector in Romania



Organised for the first time in 2002 and reaching its tenth edition this year, it has a reputation for attracting decision makers and senior managers.

INFRATRANS® is a business-to-business event structured around the exhibition dedicated to railway transport, railway managers, equipment and component suppliers and public and private railway operators.

The event took place over two days in Bucharest North Railway Station and was an opportunity for the participating companies, thousands of visitors and officials involved in the field to become aware of the latest challenges and problems of the railway sector; a sector which is more and more controlled by Romania's obligations as a EU member state. It included an exhibition of rolling stock.

The event was held under the high patronage of the Ministry of Transport and was organized by AIFR (Romanian Railway Engineers) and the Railway Club. It was attended by **Dragos Titea**, Secretary of State in the Ministry of Transport, and His Excellency **Salah el-Sadek**, the Egyptian Ambassador in Romania.

If in 2019 funds for infrastructure are no longer a problem, as one of the speakers mentioned, during these years, the challenges come from the fact that Romania is a member of the European railway sector.

The railway companies must consider an important aspect, said **Gigi Gavrilă**, president of the Authority for Railway Reform on the first day. "The national market on which we grow in recent years acquires European characteristics and is a part of an European family. Therefore, the services should be developed in this European context. It is a slightly aggressive market", he underlined.

Marian Calin Mihail, General Manager of AFER (Romanian Railway Authority), presented some developments at European level in this area. "Transport is seen as a condition for prosperity, we need less congestion, fewer emissions, more jobs and more economic growth. Transport is an important key to the functioning of European markets and the EU's ability to remain a force in the global econ-

omy”, he said. The railway sector is at “the boundary between old and new, between existing legislation and new railway legislation. The “Package IV” guarantees the European process of market liberalisation and consists of six legislative proposals divided into two pillars, one regarding the market access and governance of infrastructure and a technical one regarding interoperability, the technical safety”, he explained.

Also within this event the second edition of the Railway Job Fair was organised. It is well known that the railway sector in Romania is experiencing an acute shortage of trained personnel. On the other hand, there are many people who would like to work in this sector. The Job Fair brought together employers and potential employees. It had over 300 candidates looking for a job in various railway sectors.

DI Orlando Craciun, AIFR

Training for employees of Serbian Kargo on the maintenance of freight wagons

Presentations and practical training for maintenance of freight wagons under the conditions CSM/SMS/ECM/VPI



Thanks to the understanding of the management of the company Serbia Kargo, which recognised the need to review, analyse and apply foreign experience, coupled with the supporting efforts of EURAIL-ING Dr.-Ing. **Stevica Varadinac** (1st from the right) from Luxembourg and **DI Slobodan Vukmirović** (2nd from the right), Presidium UEEIV, the training of employees in the maintenance of freight wagons was successfully completed during the week 6th to 8th August 2019. The training was conducted without financial compensation.

It should be noted that the basic aim of UEEIV is to strengthen the position of railway systems engineers through the promotion of innovation, ideas and proposals of modernisation, competitiveness and efficiency of European railways. Further, it aims to intensify cooperation between railways, the railway industry and science (universities and scientific institutes), through seminars, presentations, round tables, workshops and other events with current information and the exchange of knowledge with other engineering companies and the society.

Through this well executed training and conformity assessment with the requirements of SMS/ECM/VPI, the intention was to present the importance of a single European railway system concept that employees should possess in order to effectively, correctly, properly and safely perform their du-

ties in the maintenance of railway wagons for the transportation of goods. Lectures, presentations and discussions on the implementation of the CSM/SMS/ECM/VPI stating the experience of European operators and owners of railway freight wagons was made possible by the presence of the representatives of Serbian Directorate for Railways, Railway Infrastructure of Serbia and Serbia Train.

The first part of the lecture was aimed at raising the awareness to all employees of their responsibility and commitment to activities in the jobs for which they are responsible in the overall system for the maintenance of freight wagons.

Throughout his presentation, **Vukmirović** explained the role UEEIV - and, as well as the importance of respecting the order of the body for certification of CSM /SMS/ ECM/ VPI and the fulfillment of all prescribed rules, demands and requirements of the order. Part of this exposure was related to the corporate identity and corporate image, to the quality of operations and the safety of the running phase of quality management and safe maintenance of railway freight wagons.

Zorica Starcevic, Director of Sector for quality business and system security, as coordinator of training, presented the most important requirements and criteria for evaluation of organisations that



apply for the CSM/SMS/ECM certificate

Varadinac, as lecturer in this part of the training session, put forward the most important facts regarding the



application of the processes CSM/SMS and ECM, as two inseparable segments that act simultaneously with unique and common requirements on the maintenance of vehicles with a carrier and its workshops or individual workshops specifically certified for ECM/VPI maintenance. Through the presentation "How to manage changes in the level of maintenance of freight wagons?" participants were able to meet with business and share experiences with its parent company CFL Cargo.

In order to check the fulfillment of all conditions and requirements for quality and safety of maintenance, an external evaluation was carried out in workshops in Niš and Belgrade, where, among other things, the basic procedure of visual inspection of the general technical correctness of wagons and interpretation of the printed labels was demonstrated to the trainees.

<http://srbcargo.rs/sr/završena-obuka-zaposlenih-za-odrzavanje-teretnih-vagona-prema-uslovima-ecm-sms/>

DI Slobodan Vukmirović, ZID

Optimising the Wheel/Rail System

22nd International ÖVG Convention of the Working Committee on Railway Technology (Infrastructure)

The Austrian Society for Traffic and Transport Science (ÖVG) organised this 22nd International Convention of the Working Committee on Railway Technology (Infrastructure) from 16 to 18 September 2019 in Salzburg. The focus of this event was on optimising the wheel/rail system and informed, inter alia, on current innovations in track work, on models predicting asset conditions as well as on the implementation of modern technologies in actual railway projects.



Right from the start the first presentation made by Grad. Eng. **Franz Bauer**, CEO of ÖBB Infrastruktur AG, clearly indicated where the future priorities of railways would or must be: digitalisation and fight against climate change. Mr. Bauer stated that the ÖBB's objective was to be en route in a completely CO₂ neutral way by 2050. Not only customers had begun to think across modes of transport but also mobility providers were called upon to expand their services over different environmentally friendly means of transport.

These topics pertaining to the future were confirmed in the subsequent panel discussion of the D-A-CH CEOs (**Sennhenn/DB-AG**, **Bauer/ÖBB**, **Boschung/SBB**), who



promised a clear commitment and joint initiatives in this respect. All three panel participants bluntly ad-

ressed the issue of asset availability and the related problems of punctuality in rail service and promised to "improve" the situation.

One option to maintain an overview of the increasingly complex "railway system" and manage large-scale projects "free of scandals" would be to rely on systems engineering (SE), the methods expertise to solve problems. SE offers an opportunity to meet the challenges of the fourth industrial revolution with its digital twins, artificial intelligences and driverless transport systems without creating scandals, cost overruns and time delays along the way. Dr. **Knoll**, Vice President of UEEIV, appealed to participants to train engineers for this future task of properly managing the technical interfaces between specialist engineers, of minimising risks and bringing projects to a positive conclusion.

In order to use the existing financial resources effectively, it is necessary to apply life-cycle management. According to Grad. Eng. **Neuper**, ÖBB, stable forecasts of asset behaviour must be available to determine future maintenance requirements, LCC calculations must prove the economic

sustainability of maintenance policy decisions and interdisciplinary work synergies must be tapped.

Dr. **Jang**, National University of Transportation, Korea, reported on improved durability of ballast track on high-speed lines based on innovative sleeper design. Problems encountered in particular in the transition zone between “stiff” bridges and adjoining “soft” embankments could be managed much better by installing “frame sleepers”.

Dr. **Holzfeind** and Dr. **Jörg** from the global market leader voestalpine announced that the company’s expertise in rails and turnouts would be pooled by merging these two to form the new voestalpine Railway Systems. This move is expected to enable the company to offer infrastructure from a single source. They also announced a world premiere: voestalpine had succeeded in developing a new rail steel (Type 340 Dobain “HSH”) able to completely prevent the generation of head check-type surface flaws. Successful tests in the Channel Tunnel between France and England as well as in the track network of ÖBB had confirmed this property.



Attempts in Europe to introduce plastic sleepers as an alternative to impregnated wooden sleepers have been going on for several years.

Grad. Eng. **Potvin**, SNCF, has carried out numerous and very extensive laboratory and in-track tests of various products. His conclusion: the problem of plastic sleepers is that they tend to expand much more than wooden or concrete sleepers and to sag more in their cen-

tre. Other causes of criticism were the quality of track position and insufficient consolidation of the ballast bed. As long as the cost situation did not significantly improve, plastic sleepers would remain niche products for special applications. (Photo 3)

The perennial issue of how to manage the interface between vehicle and infrastructure – resulting in vehicles running in a stable or instable manner – was critically analysed by Dr. **Lang**, DB-AG. He offered solutions to both vehicle and profile design as well as to condition-based reprofiling of wheels to prevent problems of stability.

One possibility, namely to measure wheel wear also under high running speeds, was presented by Grad. Eng. **Schmid**, ÖBB, who described the so-called “vehicle fingerprints”. Maintenance requirements could be identified in due time based on the systematic use of measurement data to be made available to vehicle owners for devising adequate policies.

Innovation in track machines, the use of track recording cars equipped with appropriate laser and camera technology as well as the possibility of applying fibre optic sensing to monitor the fibre optic cables that run in parallel to the track for any irregularities were other developments presented at the conference to make railways fit for the future.

More than 300 participants from all over the world could obtain an overview of the future of railways and the current level of development. The opportunities offered by digitalisation have hardly been explored to date. If railways are able to enter people’s minds as an environmentally friendly and sustainable mode of transport, they will enjoy a rosy future.

Dipl.Ing.Dr.techn. Bernhard Knoll

CIFI Seminar: Training - cost or investment?

Seminar concerning training of railway people was held during Expoferroviaria

The ninth edition of EXPO Ferroviaria, Italy’s showcase for railway technologies, products and systems was held in Fiera Milano from 1st to 3rd October. The three day event had a turnout of 8,400 visitors; there were 280 exhibitors altogether from 21 countries.

On the third day the seminar organized by CIFI and Ferpress entitled “training, cost or investment?” took place.

After the greetings from the chairman of the seminar Prof. **Renato Mazzoncini** of Politecnico di Milano, **Antonio Riva**, director of Ferpress, and **Marco Broglio**, CIFI vice

president, the General Secretary of UEEIV **Roland Wermelinger** spoke.





Wermelinger remarked that UEEIV, since its founding in 1990, has been involved in the education and training of railway engineers; for example UEEIV has already issued more than 500 certificates EURAIL-ING.

He said that in the future the requirements for excellence of a railway will increase and therefore new educational offers have to be made available.

Considering that the railway system is becoming increasingly complex, in the future it will need people who are educated as systems engineers. He highlighted the last S of "systems": the railway consists of many systems that together form a new interconnected system. Engineers operating in subsystems must understand the relationships and dependencies of the various specialist systems and how to organize them so that a railway can operate safely and reliably with all modern technologies.

Finally, he recalled that UEEIV has recently started a project to develop the requirements for a systems engineer: the aim is to offer certification that gives a good value to the development of this discipline. Development in his opinion is an investment; there will be probably costs at the beginning, but these will later produce benefits.

In the second speech, **Andrea Giuricin**, Bicocca University of Milan, highlighted how both cooperation and competition are important worldwide in the rail transport sector. On the subject of high speed rail various universities around the world are moving in this direction. Among the main technological innovations that stimulate development, he mentioned the first high-speed fully-automated line that should be put into service in China at the end of 2019.



Marco Romani, Isfort, a training company, said that effective training is a right for people and is at the same time a guarantee for job retention. He pointed out that currently in

the railway sector there is a vacancy of 30 to 35% on vacant positions due to the inadequacy of the candidates.

Giuseppe Cassino, TRAINING, a company specializing in training in the railway sector, in particular of train drivers, said that with the presence in Italy of more than thirty railway undertakings (RUs) there is a strong demand for training. TRAINING has so far trained about 400 drivers, almost all of whom are hired. However, training must be carried out by regulated companies that invest in this activity.

Stefano Impastato, Forfer, pointed out that technical skills cannot be bought but acquired. People must also take into account the attitudes of individual persons.

Rosa Di Micco, Athena, has tackled the problem of training train crews. The railway companies must support the training because it enriches its resources and leads to success in the activities.

Nietta Novielli, AIAFF, said that we must work on the human factor; training becomes a cost if there is no professional development and talents go away from the company.

Francesco Murolo, ITS Maddaloni professional school, pointed out that companies that have invested heavily in machinery and rolling stock risk not having people able to manage them.

Finally, representatives of the railway undertakings spoke.

Luigi Legnani, president of Fercargo, the rail freight transporters association, said that the labour market in the railway sector has changed a lot: we have moved from belonging for the whole working life in the same company to strong mobility. Train driver training is expensive and takes a long time: it is necessary to provide for forms of protection for companies when people, shortly after being trained, change the company.

Antonella Genoese, head of training at NTV Italo, a high-speed company, concluded by confirming that training is an investment. People must have mastered what they do and know what the company expects from them. Satisfied human resources means more efficiency.

The general secretary of CIFI, **Donato Carillo**, intervened at the end of the conference. The next edition of EXPO Ferroviaria will return to Milan in autumn 2021.

Dr.-Ing. Marco Broglia, CIFI

3rd PWI Technical Seminar - Worldwide High Speed Rail

Design & Construction Challenges from Theory to Operation



Joan Heery, President of the PWI, welcomed on 2nd October 2019 over 150 delegates to the impressive Uni-

versity of Birmingham Great Hall, for the 3rd seminar on the subject of high speed rail to be hosted by the PWI. In fact the first seminar was a joint event with the UEEIV in October 2016.

Niall Fagan, the Track Engineer for HS2, gave the opening address in which he outlined the approach taken by HS2 in defining the specification for track in what will be the UK's first nationally designed high speed railway. Yes, there is a high speed line in the UK, opened in 2007, which runs from London to the Channel Tunnel, however this is to a French design. Niall explained the importance of a whole systems approach to the design of high speed track, and the importance of a close relationship with University railway research. Asset sustainability places a limit on the use of ballasted tracks and the need for a fixed track specification.

Marco Rusch, Getzner in Austria, explained his company's development of mass spring systems from their first use at Siegau Tunnel in 2001. Through a number of examples he showed how bearings made from Sylodyn® give the superstructure greater elasticity and creates a balance that protects the components. Wear is reduced and less line maintenance is required.

The final presentation before the coffee break was by **William Powrie** of the University of Southampton. His presentation on the subject of earthworks explained the strength of earth structures and the importance of understanding the material content, the volume of water that might be present at any one time and the prevailing slope angle of the cutting or embankment. He concluded by saying that water in earthworks should not be a problem, providing it has somewhere to go.

There then followed three presentations from the University of Birmingham showing the research work being undertaken in geotechnical engineering, asset management research and risk management. The session was concluded by **Mohammed Wehbi**, a former student and now

head of the track bed investigation team at Network Rail, who showed the loading impact on the track bed of line speed increases and how these can be mitigated by the use of various techniques including geocel membranes, undersleeperpads, asphalt and frame sleepers.

The lunch break gave delegates an opportunity to network and discuss the issues raised during an excellent morning.

Gareth Dennis commenced the afternoon session with a lively presentation explaining how he saw the importance of building HS2 and expanding rail in general as part of the fight to reduce greenhouse gas emissions. Two more technical presentations followed, the first by **John Porrill**, of Pandrol. John showed developments in the design of a universal baseplate for high speed track slab panels that could be installed in each panel by robots to a specific design alignment. This was followed by **Ivana Avramovic**, Porr, a construction company based in Austria. Ivana showed the differences in construction logistics of high speed railways built with ballasted tracks and slab and went on to show how the length of the line can influence the rate of production. This is especially the case where with slab track multiple construction sites can be created. She concluded her presentation by saying how important on site collaboration is between contractors to ensure efficient production.

The final session of the day looked at electrification, gauging and connecting high speed lines into the existing network. **Richard Stainton** showed the work he has been associated with, designing minimum clearances by analysing flashover opportunities and their mitigation by the fitment of flashover surge arrestors.

Klaus Pajung, Jacobs, gave an interesting presentation on the structure gauge for high speed rail and how construction costs can be reduced if the railway is divided into discreet elements such as the open line, tunnels, stations and depots. The final presentation in a busy day was by **Peter Edwards**, Mott MacDonald, who showed how each railway engineering discipline is impacted when a high speed line merges with the existing line, and how this creates varying complexity.

Joan Heery closed the day by thanking the speakers, delegates and the University for an excellent and thought provoking day in the world of high speed railways.

Civ.-Eng. Richard Spoor, PW

Bulgarian Railway Conference

European Railway area – challenges and opportunities

National Guild – Society of Railway Track Engineers (NGS-RTE) in cooperation with State Enterprise National Railway Infrastructure Company (SE NRIC), under the aegis of UEEIV, organised this conference in the city of Sofia, Bulgaria, on 22.03.2019.

More than 50 experts from the Ministry of Transport Information Technology and Communications, the railway infrastructure, the passenger (BDZ) and cargo carriers, the branch and public organizations, as well as lecturers, scientists and students from higher education institutions took part.

Conference was opened by Ass.Prof. Dr. Eng. **Mario Galabov** – Vice-President of UEEIV, who was also moderator of the event. The participants in the seminar were welcomed by Eng. **Maria Chakarova** - Director of the "Strategic Development and Investment Policy" Directorate at the State Enterprise National Railway Infrastructure Company.

The main report on "Single European Railway Areas (SERA) - Challenges and Opportunities" was presented by Dr. Eng. **Libor Lochman** - Executive Director of the

Community of European Railways and Infrastructure Companies (CER). It was recalled that railways use only 1.7% of total transport energy,

although they carry 17.4% of domestic cargoes and 7.6% of passengers in the European Union. The rail sector in Europe generates gross value added of € 69 million from direct business and € 80 million from indirect sources. The Single European Railway Area initiative is an instrument to revitalise this type of transport across the continent. The aim is to provide: high quality, customer-oriented transport services; a level playing field; cost-effective operation; lower levels of demand for public finance and market-driven innovations. The entry into force of the Fourth Rail Package is the last step to be achieved: eliminating administrative and regulatory barriers; full market opening; effective enforcement of EU law and separation between infrastructure management and railway service provision; strengthening regulatory authorities ("market authorities") and the European Union Agency of Railways

("system authority"); enhancing interoperability and safety.

The five main Community commitments for the period up to 2024 formulated by the General Assembly held in Brussels on 21.02.2019 were presented as follows:

- intensive digital transformation of processes and services;
- enhancing customer orientation;
- an initiative to achieve a carbon-free railway operation in Europe by 2050;
- providing sources of funding other than public funding;
- attracting extra-continental rail traffic to further boost rail communications between Europe and Asia.

Also described were CER's main recommendations to European transport policy, including: promoting digitisation, research and innovation; adequate funding for technological renewal of infrastructure and rolling stock; complete internalisation of extreme negative impacts for all modes of transport; introducing measures to take advantage of the opportunities offered by transcontinental freight flows; correcting intermodal financial inequalities and improving consumer protection and working conditions.

In the second part Prof. Dr. Eng. **Simeon Ananiev** - Chairman of the Association of Bulgarian Railway Carriers, presented a report on "Information Logistics Centers and Platforms for Freight Railway Transport". The audience was acquainted with demographic and economic research, according to

which, in the coming decades, the population and businesses on the territory of Bulgaria will be concentrated in five large urban centers and three megacities. This should be the natural dislocation of future freight logistics centers and platforms. The stages for realisation of the Strategic Plan for the implementation of the Telematics applications for the freight TSI were described: systematisation of the requirements of the European legislation; analysing existing information systems and evaluating the possibility of their development; preparing a global plan for the development, design and implementation of the TSI, including an assessment of the risks associated with the most crucial stages of the construction; defining management structures; evaluating total costs and preparing a realistic



investment plan. The participants in the information logistics platform were defined: the national regulatory authority; railway infrastructure; railway carriers and undertakings; logistics and forwarding companies; intermodal terminals. The platform can use the evolving optical network of the SE NRIC and should provide connections: with freight exchanges and transport logistics services and for

locomotives and wagons; with platforms for other modes of transport in Bulgaria and with similar ones in the other countries. For this purpose, interoperability between these information systems should be ensured.

Ass.Prof.Dr.Ing. Mario Galabov, NGS RTE

ASPECT 2019 Conference

Current and future trends in the signaling sector

Organized jointly by the Institution of Railway Signal Engineers and the Delft University of Technology/NL, the conference has been part of the IRSE conference series since the mid-1980s. The first editions were always held in London, at the Queen Elizabeth II conference centre in Westminster. This Delft edition is the second one organised outside the UK after the 2017 edition in Singapore. This edition consisted of two days of papers, many in parallel sessions, preceded by an introductory day and followed by technical visits to the ProRail Railcenter and to the North South line of Metro Amsterdam.

A conference dinner at a historic location, the Nieuwe Kerk of Delft where the Dutch royals are buried, and other social events were organised where many of the more than 200 delegates attended. More than 30 countries were represented at the conference. The venue was the Aula Magna



The concept of an introductory day was very helpful for people that either recently joined the sector or for people from outside the sector. Many of the topics of the two days

of Delft University, a significant example of the architecture of the seventies. A big space was available for exhibitors.

of the formal conference were presented during this day, in a short form.

The main conference days had been split into several main clusters of current and future trends in the signalling sector. Aspect intends to introduce the delegates in finding out what is going on in the sector and to give an overview of



technology development that is going to determine the future of the operation of railways and the impact of technology in the sector. The Keynote address was presented by the Innovations Director of ProRail, **Karel van Gils**. He talked about EULYNX in the context of ProRail's renewal process.

As it is currently a fixed topic, ERTMS was the first cluster, in parallel with the Safety Cluster. CBTC and Systems as the next cluster, followed by Cyber-Resilience/Standardisation. The second day started with Performance/Human Factors, Design Resilience/Maintenance, and Innovations and Future Development/Architecture. A final session of Innovation and Future Development followed by the closing address by **George Clark**, President of the IRSE, brought the formal conference to a close.

<http://www.aspect2019.nl>

M.Sc., MBA Frans Heijnen, VDEI

ŽID Round Table "Railway Systems Engineering"

Profiling systems engineering as a matrix of the railway system



This expert meeting was held on 11/14/2019 in Novi Sad at the initiative of the Railway Engineering Society "ŽID" from Novi Sad and the Association of Graduate Engineers of Railway Traffic of Serbia "DIŽS" from Belgrade in cooperation with the UEEIV. The Provincial Secretariat for Civil Engineering, Energy and Transport provided special assistance in holding this gathering.

The seminar was attended by over sixty participants from the UEEIV, Serbian national associations' ŽID and SARTE,

- Belgrade, Ass.Prof. **Ivan Belošević**, "University of Belgrade – Faculty of Transportation";
- Faculty of Technical Sciences Novi Sad, Prof. Dr. **Gordan Stojić**, "The system of education of railway engineering staff and its permanent training";
- High Railway School in Belgrade, Dr. **Zorica Milanovic**, "Railway Education in the Republic of Serbia";
- Traffic School "Pinky" Novi Sad, B.Sc. **Slobodan Jovanovic**, "Education and Training of Students in the Traffic School Pinky"

Transformation of the entire railway economic system requires the harmonization of certain changes by sectors according to the discipline of the business unit. This includes main infrastructure works on modernization and reconstruction, as well as the introduction of new players into the railway business. This hugely changes the functioning of the railway as an industry with an indispensable need for the introduction and permanent use of new modern ideas, technologies, knowledge and skills as special resources.

This expert meeting was organized in order to determine through profiling, systems engineering as a matrix of the railway system in the functioning of different processes, technologies and techniques, i.e. modes of operation, through joint action, to determine the required level and quality of the engineering staff for the railway.

university and faculties and higher education institutions. These are the organisations that train engineers of all professions in the expert fields of railway, ministries in charge, state institutions and chambers of commerce of Republic Serbia and Region Vojvodina, representatives of railway companies and other companies of various kinds that employ engineers who work in the railway industry.

Nenad Grbic, Provincial Secretary ŽID, gave a welcoming speech in the programme part and M.Sc., MBA **Frans Heijnen**, President of the UEEIV, welcomed the audience and members of UEEIV. Other speeches and presentations were:



- UEEIV Vice President, Dipl.Ing.Dr.techn. **Bernhard Knoll**, Systems engineering;
- UEEIV General Secretary, Dipl.-Ing. **Roland Wermelinger**, "Systems engineers certification";
- Faculty of Transportation in

Further, the aim of this meeting was to talk and discuss a complete analysis and broad overview of the current position of engineers in the field of railways, as well as to determine the real need to clearly define the profile of "Railway systems engineers" in terms of their education through regular schooling and through continuous specialist training.



The basic conclusions, derived from the discussion of all present, including presentations made at the meeting, as well as specific remarks, suggestions and comments received subsequently by E-mail, can be summarized in three basic groups:

1.) "A Railway systems engineer" is someone who, in addition to basic higher education, possesses the necessary skills and has much needed experience. It can be said that such a professional profile emerges or grows only in the course of work engagement within various influences where, in addition to elementary education and renewal of

knowledge, the individual embraces continuous training. This specialist must have their own strong enthusiasm and personal natural inclination to leadership and a propensity to such an approach and the development of their own professional career.

2.) A required level of overall knowledge. The "Railway Engineering System" should, in accordance with the regulations, be introduced in the future as a basic guideline on the required level of school knowledge and a common part in the program for taking all professional exams for employees in each field of the railway industry. It is also important that the acquired experience, knowledge, training and skills are realistically valued and particularly stimulated or motivated by the employer, recognising the contribution that the railway engineering systems approach can make to the workplace.

3.) Considering the current situation in this field, it is necessary that all participants of this meeting, in the sphere of their influence, competence or action, take their own actions or special support measures in order to bring the common systemic level of knowledge of systems engineering to the workplace. This includes the training and skills acquired, as well as gaining the necessary experience required for profiling the railway system engineer of any technical profession who, through his knowledge of the functioning of the overall railway system and the economy, will be able to contribute to the efficiency of work of each subsystem. This will lead to a reduction in the overall cost of labour, increase the overall safety and achieve a higher level of quality and specific knowledge for all employed engineers.

<http://www.psemr.vojvodina.gov.rs/index.php/item/621-zeleznica1119>

DI Slobodan Vukmirović, ŽID



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- // railway surveying engineer

Track Machine Operator

- // to ensure quality workmanship on the track

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PWI practical track work challenge

Challenge 2019: Providing a safe track work experience for the young engineers

The third challenge took place between the 7th and 11th of October on the Churnet Valley Railway. This is a 10.5 mile long heritage railway between Stoke on Trent and Uttoxeter on part of the former North Staffordshire Railway. It has plans to extend northwards into the town of Leek by 2022, which would be a major milestone, and this year's challenge was to construct the first 200 metres of that line north of Leekbrook Junction.

Once again **Malcolm Pearce** volunteered to organise the event on behalf of the PWI, supported by **Roy Hickman**, **Richard Antliff** (PWI) and **Gregory Wilson** of the Churnet Valley Railway.

The outline plan was to survey the site such that line and level of the plain line ex-tension could be designed. It would be laid on an old track bed formation, so the specification was a 175-mm-laser controlled dig below new sleeper bottom with recycled ballast. Part of the plain line would be loose sleeper relaying with the remainder laid as prefabricated panels (18.3 metres).

The residential base for the two full days of activity was in Newcastle under Lyme. Delegates gathered on the Tuesday evening where **Malcolm Pearce** explained the arrangements for the next two days and each team of twelve young engineers met with their respective site supervisor for their first briefing.

An advantage this year was that many of the corporate members volunteering their services were the same as the previous year, which meant that plant and small tool operators and their associated support teams were familiar with the arrangements, even though it was a new location and slightly different work.

A key aspect of the Challenge is to provide the young engineers with a safe track work experience no different to that they could expect on a Network Rail or TFL worksite. To ensure the working standards were being maintained the PWI was indebted to Network Rail who provided two of their senior worksite managers for the two days.

The first day gave the young engineers experience of setting up beacon lasers and using laser controlled 360 degree excavators and a dozer to accurately excavate the



formation base level. New ballast was laid to level and the sleepers for the first two lengths of track were manually installed.

At late afternoon the panels of track, which had been brought up from Cheddleton, had been installed and fish-plates fitted. Top ballast was placed by machine and the arduous task of boxing in undertaken in time for one of the heritage railway's Plasser 07 tamping machines to commence putting a final top and line to the newly laid track.

The objective had been achieved; twenty four novice track engineers had successfully worked in teams and installed the first 200 metres of the Churnet Valley railway's new line to Leek.

The event was closed by the PWI's Chief Executive, **Stephen Barber**, who thanked all of the volunteers who had made the two days so successful and presented the young engineers with their certificates of achievement.



For the Churnet Valley Railway there was one more day to come, as on Friday 11th October they ran a special steam train over their new track in a joint celebration with the PWI and officials from Staffordshire Moorlands District Council who had helped fund the work.

Civ. Eng. Richard Spoor, PWI

The Association of German Railway Engineers VDEI celebrates its 70th Anniversary

High Expert Knowledge Underlying Practical Commitment to all Technical Fields

On 2 November 2019, VDEI celebrated its 70th anniversary. The Presidium staged a ceremony with over 100 members and guests of honour in Frankfurt am Main.



Mainka, Warlitz, Hüske

In his welcoming address, President Dr. **Thomas Mainka** recalled the chequered history of the Association and stressed: "I really appreciate the personal commitment of all volunteers who help us outside their private and professional life to pave the way for the next generation of engineers in the digital age".

Congratulations came from City Councillor **Klaus Oesterling** on behalf of the City of Frankfurt, and from Dr. **Klaus Vornhusen**, Corporate Representative of DB AG for the Land of Hesse, on behalf of Deutsche Bahn.



Afterwards Grad. Eng. **Volker Kefer**, President of the Association of German Engineers (VDI), spoke about "Engineers in the Age of Digital Transformation".

He was followed by **Frank Sennhenn**, CEO of DB Netz AG, who addressed the topic of "Challenges for Deutsche Bahn in the Forthcoming Years".



The event was rounded off by the award ceremony for the winners of the in-house photo competition, the performances of the poetry slammer Marvin Weinstein with a text written exclusively for VDEI and of the wind quintet of the Friedrichsdorf music school.



In conclusion Dr. **Joachim Warlitz**, Vice-President of VDEI, gave a brief overview of the goals currently championed by VDEI and thanked all

those who had contributed to the successful event. The anniversary celebration was entertainingly and professionally moderated by Dr. **Katja Hüske**, DB Engineering & Consulting GmbH.

*EI – Der Eisenbahningenieur, Issue 12/2019, p 68. editorially shortened text
Photos: Wiedekind*

SITK's Friendly Visit to VDEI

Inspiring Visits to the Potsdam Palaces and the Old Imperial Train Station

17 colleagues of the Polish Railway Engineers' Association SITK, NL Szczecin, had accepted the invitation of the VDEI's Berlin-Brandenburg Chapter to come to Potsdam. Chapter Chairman Grad. Eng. **Uwe Richter** welcomed the Chairman of the Board, Mgr. inż. **Ireneusz Furmański**, and his group on the Baroque Bassin Square with its French Church.

The subsequent trip to the New Palace, or Neue Palais, was the first opportunity for a guided tour. It took the participants past the historic Dutch Quarter, or Holländerviertel, through the Castle Quarter (Burgviertel) to the Old Market Square (Alter Markt), which – together with the rebuilt Stadtschloss Palace, the St. Nicholas Church (Nikolaikirche), the Old Townhall (Altes Rathaus) and the Museum Barberini – forms the historic centre of Berlin-Brandenburg's capital. The extraordinary urban composition of palace, church and townhall square all in one as well as the artistic design primarily from the Frederician Rococo era form a unique ensemble. From here the group travelled on to the Orangery and the New Palace.

The New Palace is the most impressive and largest building



of the Sans-souci palace grounds and is located on the west side of the park. Completed under King Frederick the Great in 1769, the splendid palace fascinates with its numerous paintings in the sumptuously decorated Rococo-style rooms, which we saw for ourselves during an audio self-guided tour.

The next stop was the historic Imperial Train Station, or Kaiserbahnhof, located near the palace on the Berlin-Magdeburg line. It had been built between 1905 and 1909 for the German Emperor William II. The former "Court Station



in the Wildlife Park" now serves the Deutsche Bahn AG as a modern conference and training centre (training academy) offering an exclusive ambience for executives, trainers and

speakers. During a guided tour we were impressed by the grand seminar rooms, the video conference room and an auditorium for 170 people, unique meeting rooms in historic passenger rail cars as well as the vast garden.

Finally, we visited Sanssouci Palace in the eastern part of the park, one of the best-known palaces of the Hohenzollern dynasty in Potsdam. Based on his own sketches, King Frederick II had this Rococo summer residence built between 1745 and 1747 as a "maison de plaisance", or pleasure palace, with all the rooms on one level to ensure easy access to the garden and the famous vineyard terraces.



After this eventful day, filled with much culture and a modicum of railway history, we bid farewell to our Polish guests at the historic windmill.

Grad. Eng. Martina Schaar, VDEI

We mourn

DI Reto Danuser
*Member of the Presidium
and the Board of Advisors
Honorary member*



✠ 30.05.2019

EURAIL-Ing Wilfried Lorenz
*Head of SCB
Honorary member*



✠ 30.05.2019

Calendar of events 2020

Status: 20.11.2019

23 Jan.	Wien/AT	 	Congress: Systems engineering
24. Jan.	Wien/AT		Presidium meeting
30. Jan.	Leipzig/DE		64th Railway technical conference: Digital interlockings
04. Mar.	Manchester/UK		Utilising New Technology on Railways
12.-13. Mar.	Wien/AT		Vienna Railway Colloquium: Public transport - growth and performance limits
03. Apr.	Berlin/DE		Presidium meeting
28. Apr.	Innsbruck/AT		Railway switch conference
12.-13. May	Darmstadt/DE		2nd Conference Cyber Security
14. May	Darmstadt/DE		62nd Track construction symposium: Future initiative railway construction
15. May	n.n./CH		Symposium: Appenzeller Bahnen AB.
27. May	Eisenstadt/AT		Annual meeting
04. Jun.	Albena/BG		Presidium and General assembly meeting
05. Jun.	Albena/BG		Seminar: Training and implementation of staff for the needs of the railway transport
06.-09. Sep.	Graz/AT	 	46th conference: Modern rolling stocks www.schienefahrzeugtagung.at
07.-11. Sep.	Toronto/CAN		IRSE Convention: Long-distance and subway interoperability challenges in the Toronto area www.irse.org/Get-Involved/Events
22.-25. Sep.	Berlin/DE		InnoTrans 2020 , the leading international trade fair for transport technology
12.-14. Oct.	Rostock/DE		18th European Transport Congress: Innovative Transport Systems in European Logistic Networks - Options for Non-Metropolitan Regions? www.epts.eu/etc2020
dd. Oct	Milano/IT	 	Seminar: Systems engineers and engineering companies
dd. Nov.	-- /UK	 	Event: Design, operation and maintenance of railway specific plant
12.-13. Dec.	Bellinzona, Lugano, Locarno/CH		Commissioning of the 'Ceneri Base Tunnel' Camorino - Vezia https://ceneri2020.sbb.ch/

For more information see:



www.ueeiv.eu

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