



Ing. Stanislav Šafranko

**E-Learning a České dráhy – firma s velkým počtem zaměstnanců  
E-Learning and Czech Railways – Large-sized Company**

E-learning is a complex education system provided to the Czech Railways (ČD). From common courses or re-training courses, through the regular drilling courses with the optional contingency and emergency state practices on the software simulators, to the system of supporting help, or the so-called electronic consultation centre. The training might also be carried out on the dispatch office simulator (for station dispatchers). The track section simulator is currently under development (for engine drivers).

Ing. Martin Pichl – doc. Dr. Ing. Miroslav Svítek

**Telematika v železniční dopravě s ohledem na harmonizovaný  
a synchronizovaný rozvoj ITS v Evropě  
Telematics in the railway transport with a view to the Europe-wide harmonised  
and synchronised ITS development**

The article summarises the current situation in the field of Intelligent Transport System and Services (ITS) in Europe and the Czech Republic, both in terms of the technical aspects (ITS system design and architecture, ITS system basic tools and devices, etc.), and legislative issues (Regulation 2001/16/ES for railway transport). In addition, the Central and Eastern European regional activities are presented, to explain the background of the CONNECT draft (Joint Euro-regional Project).

Ing. Adolf Mazurka

**Využití čipových karet v osobní dopravě  
Chip Cards in the Passenger Traffic and Transport System**

The article provides the basic information about the development of the chip card technologies and possibilities of their utilisation within ČD. The author generally speaks of the particular spheres and methods for practical utilisation of this state-of-the-art technology within the passenger traffic and transport systems. The article points out several options to adopt in the statistical and accounting data collection and further evaluation thereof for the purpose of the ČD management strategic decision-making processes.



Ing. Miroslav Šolc

**GHOST – součást informačního systému traťového hospodářství  
GHOST – a part of the Track Management Information System**

The GHOST program supplements the complex of programs incorporated in the ČD integrated track management information system. It is primarily designed for an every-day viewing and assessment of the track section parameters, usually expressed in a large number of values. It allows for an operative identification and localisation of the critical points in the particular track, or cross-checking and monitoring of the track work efficiency and stability. In combination with the ECOTRACK and SORUT programs, it forms a complex which is to contribute to the economical maintenance of the track on the basis of all objective track diagnosis results available. At present, the project is being gradually introduced and launched to the operation and decision-making processes.

Ing. Štefan Mayerberger – Ing. Vít Bureš

**Měření prostorové průchodnosti tratí  
Measuring the Spatial Capacity of the Railway Track**

ROT-HSware spol. s r.o., in co-operation with the Railway Research Institute, Pardubice Office, has compiled a project for the equipment to continuously measure the spatial capacity of the railway track (hereinafter "PPT"). The suggested solution utilises the modern laser sensors and transmitters with a modulated rotating-prism-wobbled laser beam. The properties of these laser sensors and transmitters allow for the 3D spatial capacity measurement. The project is tailored to the needs of ČD a.s.

Ing. Ľubomír Záborský

**Zariadenie pre diagnostiku zberačov elektrických hnacích vozidiel  
Diagnostic Equipment for the Driving Vehicle Collectors**

The article delineates the equipment employed in diagnosis of the electrical driving vehicle collectors monitored in the every-day operation. The equipment is a result of the RVT assignment and works in a pilot operation in the Žilina – Bratislava railway track, section Piešťany – Veľké Kosťany.



Ing. Aleš Hamáček, Ph.D. – doc. Ing. Vlastimil Skočil, CSc.  
– Ing. Václav Boček, Ph.D. – Ing. František Steiner, Ph.D. – Ing. Jiří Tupa

### **Současný stav a prognóza životnosti relé NMŠ Current State and Prognosis of the NMŠ Relay Lifetime**

Measurement results substantiating and supporting to a limited extent the prediction of the behaviour of the relay components being examined in the envisaged operation modes, suggest the following recommendations to the relay system operators and users: To check the relay predominating parameters periodically, to keep all records related thereto. To keep all the records on the reasons for the relay shut-down, to observe the frequency thereof. To measure and record all parameters of the relays being decommissioned/shut down. To categorise the operation environment and operation mode of the relay, and primarily, to observe the relay in heavy duty conditions more often than usually. Not to repair the relay with non-conforming parameters and/or those showing signs of corrosion. To observe and monitor the parameters of the particular types, models and series and to communicate with the manufacturer with a view to improve or at least to maintain the relay reliability and lifetime. To store the stand-by relay as per the defined and conforming environment. Not to decommission/shut down the relays for a mere reason of their advance age. To compile and implement a system for monitoring the relay parameters in dependence on their service time and operating conditions. The tests performed and results obtained did not indicate any need for shutting down the relay with certain period elapsed from the date of their production or commissioning. On the contrary, it is much necessary to observe the relay parameters systematically to prevent their operation failures.

doc. Ing. Miloslav Holzmann, CSc. – doc. Ing. Ivo Dlouhý, CSc. – Ing. Josef Zbořil

### **Mechanické vlastnosti a lomové chování bainitické oceli na odlitky a její využití v srdcovkách výhybek Mechanical Properties and Fracture Behaviour of Bainitic Steel intended for Castings and Utilisation thereof in the Points Frog**

The article presents the results obtained from the evaluation of the mechanical properties and fracture behaviour of the newly developed bainitic steel castings Lo8CrNiMo intended for the points frogs. For the purpose of comparison, the UIC 900 A rail steel was examined and evaluated. The tests were focused on the strength and deformation characteristics as determined by the tension test at 20 and -20° C. Tenacity (ductility) was evaluated on the basis of the instrumented Charpy-piece V-notch impact bend test and on the basis of the fracture toughness measurement. The fracture toughness was identified on the basis of the Charpy's pieces with fatigue crack, with static and dynamic loads at 20 and -20° C. These tests employed the test piece of standardised dimensions, thickness of B = 25 mm, which was statically loaded in a three-point bend at temperature of -20° C. In all three toughness



characteristics tests, the Lo8CrNiMo steel demonstrates significantly higher resistance against brittle failure in contrast with the same of the rail steel. Furthermore, it was detected that the dynamic fracture toughness of the Lo8CrNiMo steel is practically identical to that under static load. The test results are of practical importance for the dynamic loads imposed on the points frogs during operation.