

**INTERACTION BETWEEN FLEXIBLE WHEEL-SET AND
CORRUGATED RAILS**

Belotserkovskiy, Pavel M.

pp. 6 – 17

Railway track represents a periodic structure. In the presence of short-pitch rail corrugation, a wheel moving at high speed induces the vibrations whose frequency is greater than the frequency of the second symmetric flexural mode of a wheel-set. Therefore, the wheel-set cannot be regarded as a rigid body. In this study, the wheel-set is modeled by means of five lumped masses connected to a weightless flexible axle. These masses correspond to the boxes, to the wheels and to the wheel-set axle. Contact deformation due to a periodic contact force between the wheel and the rail causes an approach of the wheel centre to the rail centre-line. This approach is calculated by means of non-linear contact mechanics. The periodically varying curvature of the rail vertical profile causes periodic variation in the wheel-rail contact stiffness whose period equals the corrugation length. The above force is determined by means of Fourier series.

Key words: rail track, periodical model, wheel rolling, wavy wear of the rail, corrugated rails, flexible wheelset, resiliency pattern, Poisson ratio, Fourier series, boundary-value problem, comparative computations.

**ON-LINE COMPUTATION OF ELECTRICAL ENERGY QUALITY
RATES**

Artushenko, Vladimir M., Abbasova, Tatiana S.

pp. 18 – 23

The authors propose to analyze the quality rates of electrical power with the help of microprocessors and specially designed software. In order to compute the rates the authors created a technique to complete a database of rates through digital on-line filtering. The suggested technique of application of Kalman-Bucy filter method for filtering measured data in the problems of quality analysis of the power, which enters the network after DC voltage transformation from the outlet of autonomous generator for non-traction and non-transport customers into the AC current with the help of inverter, allows to analyze on-line electrical power quality rates. Using algorithm of digital filtering the authors have formed a sequence of values of a discrete function $y = f(t)$. The numerical analysis of that function gives

possibility to determine on-line all power quality rates as well as auxiliary rates, stipulated by state standard 13109-97.

Key words: system of power supply, renewable electrical power sources, railway centers of data processing, digital filter, filtering algorithm, electrical network parameters, power quality rates.

SYSTEM APPROACH IN MARKETING OF PASSENGER TRAFFIC

Aksenov, Ivan M., Razumova, Ekaterina N.

pp. 24 – 29

The authors consider system approach and system analysis as a methodological basis necessary to assess complex economical processes in the market of transportation services. This basis helps the authors to analyze passenger traffic system and to substantiate the core system role of market studies.

They suggest their own definitions and understanding of interdependent character of internal and external factors which have direct influence on passenger traffic.

They argue that the system approach and the consecutive search for market information to conduct a system analysis have direct repercussions for transport practices and cite the negative example of acquisition of foreign rolling stock which was not adapted to local conditions.

Key words: system approach, system analysis, economics of passenger traffic, market studies, system features of relations and environment.

PATH CHOICE IN STEP-BY-STEP ALTERNATIVE ROUTING IN WIRELESS TELECOMMUNICATION NETWORK

Barsky, Arkady B., Said Mohammed Mukred Nadj (Republic of Yemen).

pp. 30 – 37

In order to send the frame to the address the authors suggest selecting an adjacent node, taking into account the preferred predetermined weights of those nodes and their current load rates. The adaptive algorithm of alternate path choice is based on logical neural network. Simulation, made by the authors, has shown better values of mean time to execute applications and higher probability of their execution as compared to algorithm of non-alternative choice of neighboring routers.

Thus a mean time of execution of application with alternative path choice algorithm DT_{alt} exceeds minimum possible time for the range of change $12 \leq s \leq 16$ (applications per step) in a changing range $0,3 \leq DT_{альт} \leq 1$ (steps).

The mean time of execution of application with the method of alternative path choice has been reduced as compared to non-alternative path choice by 8% for $s = 12$, and by 23% – for $s = 16$.

Key words: theory of waiting lines (systems), queuing theory, Markovian chain, telecommunication system, information interoperability, optimality criterion, computer network, logical neural network, routing, modeling.

LINEAR ACCELERATIONS OF REINFORCEMENT POINTS OF THE CAR BODY

Kozlov, Mikhail P., Kozlov, Maxim V., Koturanov, Vassily A.

pp. 38 – 40

While the rail car is moving, the disturbing forces applied to the reinforcement points of the body are also changing. Thus the symmetric load causes bouncing, and antisymmetric load causes rocking. The authors have studied the impact of oscillations of bouncing and rocking of the car body on the features which predetermine safety of the rolling stock traffic and substantiated the methods of such analysis. The oscillations of bouncing and rocking are considered referring to different linear and inertial parameters of the cars' bodies. The authors undertake an attempt to study and assess the existing differences in linear accelerations in order to better select the features of springing of the car body.

Key words: track, rail car, moving parts, car body reinforcement points, linear accelerations, bouncing, galloping, rocking, springing, dynamic dependencies.

SIMULATION OF THE GEAR OF THE CARRIAGE OF STRAIGHTENING AND TAMPING MACHINE PMA-1

Kovalsky, Victor F., Pushkin, Andrey I.

pp. 42 – 47

The article describes the features and methods of mathematical simulation of hydraulic displacement gear of lengthwise cyclic displacement of the movable frame of straightening and tamping machine PMA-1 with the use as displacement of twin rods hydraulic cylinder device. The authors describe the main results of simulation and analyze them. They also put forward some recommendations concerning tuning of control system of the driving gear. The general conclusion is that twin rods cylinder simplifies the controlled hydraulic processes as compared to other existing systems and removes the problem of additional feedback.

Key words: straightening and tamping machinery, hydraulic gear, mathematical simulation, simulation model.

LOOSENING OF ADFREEZED COAL BY ELECTRIC-HYDRAULIC METHOD

Kim, Constantine C., Shpilev, Mikhail A.

pp. 48 – 55

In winter the railways face a problem of unloading the adfrozen coal out of gondola cars. This rather complicated problem is due to transportation and storage of solid fuel in winter weather conditions. The authors suggest a new method of loosening of coal conglomerate with electric-hydraulic method. Simultaneously the authors study features of elastic medium, which influence the level of generated pressure as well as the conditions resulting in optimization of suggested method. The conclusions show that the medias with low rigidity like adfrozen coal conglomeration limit amplitude of pressure because of deformation of discharge cavity. In order to treat the adfrozen coal conglomerate in the remote zone and with only one discharge chamber ($r=1$ м) it is necessary to achieve the pressure within the discharge cavity not less than 108 Pa. That's why it is necessary to use impulse current with integral of action not less than 1000 A²×sec.

Key words: railway, adfrozen coal conglomerate, electric-hydraulic effect, discharge, air blast, destruction, elasticity theory, tension.

CAVITATION WEAR OF HYDRAULIC UNIT PARTS

Morozov, Gennady P.

pp. 56 – 61

Cavitation as a phenomenon is peculiar to parts and nodes of hydraulic units of the internal combustion engines, to diesel locomotives systems. The article studies the cavitation phenomenon from different points of view. The author analyzes common reasons of cavitation wear, techniques to avoid its consequences. The author uses the practical examples which allow assessing negative impact of defects and threats, choosing optimum technical conditions of operation of internal combustion engines. The article refers also to the brief analysis of most common causes of increased cavitation wear, such as incorrect choice of coolant liquid, depressurization of the cooling system, engine operation under low temperature, low quality of parts, such as cylinder sleeves.

Key words: internal combustion engine, diesel locomotives, hydraulic units cavitaiton, simulation, preventive measures, operation conditions.

REINFORCEMENT OF RIDGES AND REDUCTION OF WHEELSET WEAR AND TEAR

Petrov, Sergey Yu., Kostukevich, Alexander I., Riabov, Andrey A.

pp. 62 – 69

Reducing of wear and tear of a friction pair wheelrail is one of the main tasks to increase efficiency of railway rolling stock operation. The authors suggest analysis of technologies of thermic reinforcement of the ridges of wheelsets using comparative tests of locomotives. The results of testing of three techniques of metal working, respectively laser, plasmic and electrocontact, allow to select in the framework of comprehensive tribological approach the most reliable and promising technology.

The study has shown that the three technologies have differences as for equipment, consumables, technical conditions and staff qualifications necessary to apply them. There are also differences concerning conditions of heating and cooling of reinforced metal (one-time or cyclic heating) and ecological aspects (light radiation, noise level etc).

The reinforced zones differ in distribution of firmness and grain dimensions by depth, kinetics of temporary and residual stress, geometry and consequently in their influence on wear and tear process.

Experiments have proved that electrocontact reinforcement permits to achieve the same results (as for reducing wear of ridges) as the plasmic hardening. When using four band zones of reinforcement the mean intensity of wearing of the ridges with electrocontact reinforcement is higher than the wearing of ridges reinforced with plasma by 0,08 mm/104 km. If six zones of reinforcement are used, the mean intensity of wearing of the ridges is the same for plasmic and electrocontact hardening.

The authors suppose that electrocontact technology is more promising as it has more possibilities to positively affect the ridges wearing (by changing geometry of band zones of reinforcement, their number and location in the reinforced zone). But to correctly compare the data it is necessary to economically assess the technologies taking into account all costs resulting in comparably equal rates of wearing of ridges during operation of rolling stock.

Key words: railway, tribology, locomotive, wheelset, ridge, wear and tear, reinforcement, technology, service testing.

BALANCING TRANSFORMER OF TRACTION ELECTRIC POWER SUPPLY

Bekrenev, Vassily Yu.

pp. 70 – 77

The author analyzes application of balancing transformers for traction power supply at the electrified railways of JSC Russian Railways, lists positive effects of their operation in AC networks especially under the high voltage of 94 KV at Oktiabrskaya railway. The author formulates the conclusions and some suggestions concerning operation of balancing transformers, assesses possibilities of such units for the possible use during reconstruction and modernization of AC traction substations, taking into account the requirements for increased labor and electric safety.

Key words: railways, balancing transformer, symmetric effect, power quality, Scott effect, current balancing, rate of unbalance, traction power supply, substation, electrification.

VERTICAL OSCILLATIONS OF THE METRO WAGON WITH PNEUMATIC SUSPENSION

Serdobintsev, Evgeny V., Ye Win Han (Myanmar).

pp. 78 – 84

The public organizations of Myanmar and Russian experts cooperate in engineering of the metro in the country's largest city Yangon. The preparation of requirements specification for manufacturing of the rolling stock adapted for local conditions comprises a study on dynamic features of the metro wagon. One of the directions of the study concerns mathematical model of kinematic characteristics of pneumatic springs in the body unit. The article refers to the results of comparative analysis of different model patterns, includes the assessment of quality performances as for spring and pneumatic central suspension of metro wagon.

Key words: metro, Myanmar, Yangon, rolling stock, springing, pneumatics, quality parameters, mathematical model, comparative analysis

CONSTRUCTION OF RAILWAYS: EASTERN VECTOR

Macheret, Dmitry A.

pp. 86 – 89

The author on the basis of retrospective statistical analysis has revealed the growing importance of the eastern part of the Russian railways network and defined the factors which determine such an importance now and will be effective in future.

The article describes the insufficient level of railway infrastructure in Siberian and Far eastern regions and substantiates the demand for its radical rise in conformity with the Strategy of railway development in Russian Federation for the period till 2030 on the basis of common efforts of the State, regions, JSC Russian Railways and private business, shows some mechanisms of attraction of supplementary financial resources for new railway construction in eastern part of Russia.

The conclusion reads that the development of railway infrastructure in Siberia and Far East will facilitate the arrival of new investments to these regions, promote

Russian goods and services expansion to foreign markets, help to create a modern transportation services market. The railway development will also have a positive effect on enhancing economical capacity of the eastern part of Russia, will positively affect the conditions for wellbeing and business and will contribute to development of mutually beneficial relations of Russia with the states of Asian and Pacific region.

Key words: economics, railways, market relations, infrastructure, projects, construction, budget system, private capital, regional investments, Siberia, Far East.

ANTI-CORRUPTION EXPERTISE OF LEASE RELATIONS

Koriakin, Victor M.

pp. 90 – 95

The procedure of under-leasing of lands leased by JSC Russian Railways requires measures to eliminate corruption causing factors. The article deals with the analysis of such factors, and the analysis plays the role of anti-corruption expertise.

The author puts forward some suggestions aimed at enhancement of existing laws and regulations on the lease relations, as well as application of acts within the competence of different governing and controlling institutions.

Keywords: Russian railways, land lease, under-lease, corruption causing factors, anti-corruption expertise.

MODEL OF SELF-ASSESSMENT OF THE BONUS AWARDED QUALITY

Sorokina, Anastassia V., Basyrov, Marat A.

pp. 96 – 101

The authors study capacity and comprehensive character of self-assessment principles in international and Russian models of awarding bonuses for the quality performance. They underline the diversity of approaches in different economic sectors, conformity with the levels of organization development of the companies, the

difference of self-assessment models with the ISO 9000 standards, which consider only the processes aimed directly at creating qualitative final product. The bonus system is considered as a tool to increase economic effectiveness and higher performance of the staff of transport holding-type companies.

Key words: bonus for quality, criteria of self-assessment, economic stimuli, levels of organization development, transport features

INNOVATIONS: TRANSIT, COSTS, EFFICIENCY

Shapkin, Ivan A.

pp. 102 – 107

The author analyzes the aggregate methods of assessment of efficiency of innovations in international carriage, describes particularities of competitiveness of railway freight, dependencies between the level of transit rate and pricing of transportation services. The author suggests his own understanding of transportation component in the final product cost. The article comprises examples of main indices of economic efficiency of innovations. Transport logistics is explained as a tool of consolidation of the economic interests of all the participants of the process of delivery of market demanded goods.

Key words: railways, economics, efficiency, innovations, international traffic, logistics, rate, pricing, transportation component of good.

ORGANIZATION OF PURCHASES FOR INTERNATIONAL INFRASTRUCTURE PROJETS

Nikiforova, Marina S., Durandina, Anastassia Y.

pp. 108 – 110

The authors study participation of state corporations and companies, who are natural monopolies, in the purchases of the goods and services during execution of international infrastructural projects, particularly the jurisdiction of the contracting parties, functions and forms of project activities, features of financing and investments, managerial aspects of accompanying business-processes. All these aspects undergo factorial and structural analysis at example of JSC Russian Railways taking into consideration federal laws and regulations.

Key words: economics, transport, infrastructural projects, international treaties, financing, investments, purchase of goods and services.

COMPARATIVE ANALYSIS OF SOFTWARE PACKAGES

Buchkin, Vitaly A., Ryzhik, Ekaterina A., Lenchenkova, Elena P.

pp. 112 – 121

The authors propose review and comparative analysis of model series of software packages for designing and reconstruction of railways. The authors suggest a set of criteria for functional analysis of software packages which allow real comparison of characteristics, conditions and requirements for different stages of a life cycle of a designed object, determine most probable directions of searching for creative decisions for the nearest future and for a longer period in the framework of extensive and innovative scenarios of development of designing capacity.

Key words: railways, software package, software unit, criteria of functional analysis, extensive scenario, innovative scenario.

EXPERT APPROACH TOWARDS ORGANIZATION OF TRANSPORT AND LOGISTICS CENTER

Komarov, Constantine L., Sherstobitov, Dmitry S.

pp. 122 – 129

The authors study, using expert technology, the system organization of terminal logistics complexes in large transport nodes like Novosibirsk and Krasnoyarsk. The article refers to conceptual contents of the model of such complexes, defines their role for the development of logistics business as strategic direction of diversification of activities of the corporations like JSC Russian Railways, describes stages of the generation of relevant services market in the region and municipality. The second part is devoted to the expert technology used by terminal logistics complexes regarding the passenger traffic and intercity public transportation services.

Key words: railways, passenger transport, commuter and city passenger traffic, logistics, terminal logistics center, expert technology

PRINCIPLES OF ROUTING AND DISTRIBUTION OF PASSENGER TRAINS BY CATEGORIES

Kopylova, Ekaterina V., Mazurkina, Olga N.

pp. 130 – 133

The authors, using the example of the USA, assess the existing approaches towards organization of railway passenger traffic. The main revealed trends are balance of interests of carriers and passengers and the priority of customer focused strategy. Such management credo determines the choice of train routes and their categories, which both should suit customers' demand.

Key words: railway, passenger traffic, categories of the trains, customer demand, balance of interests, principles of management, organization of routes

MODELS OF THE POLYGONS OF BULK CARGO DELIVERY

Rubtsov, Dmitry V.

pp. 134 - 140

The article deals with the study on organization of train operations within a polygon of bulk cargo delivery to the complexes of cargo transshipment, based on simulation of traffic process. The required capacities of track development at the stations are revealed and the optimum variants of control of departures and train advancement are proposed. The author determines certain regularities inherent to station conditions. In particular, more is the transit time of scheduled trains, less is the efficiency of the control of their departures towards the stations adjacent to the track of customer enterprises. And if the port station has minimum of tracks, then the technical station has the priority to control the departures of trains.

Key words: railway, traffic process, train operation, polygon of delivery, simulation, departure control, station capacity, optimization of management.

SERVICE ROLE OF IT-DIVISIONS

Lemdianova, Irina M., Skorovarov, Alexander S.

pp. 142 – 145

The article describes the role of IT-units in the structural organization of JSC Russian Railways, the service model of IT-management based on ITSM/ITIL principles. The authors argue that interaction of ITdivisions with service customers permits engineering and technical maintenance of business processes and transforms IT-divisions into business partners of railway entities which are their services'

customers. The model structure proposed by the authors shows the core elements of the service and first of all the services of the network node of JSC Russian Railways Internet.

Key words: railways, IT, engineering and technical units, management, service model, IT-services' efficiency, network Internet node.

ASSESSMENT OF THE CITY PUBLIC TRANSPORT BY PASSENGERS

Gudkov, Vladislav F., Nguyen Thi Thu Huong, Dulina, Nadejda V., Mylnikov, Petr A.

pp. 146 – 150

The authors have made a survey of opinions of the residents of Volgograd on the quality of transportation of passengers by city public passenger transport. As the result some new approaches towards solution of problems of passenger transportation and optimization of city transport network management were suggested.

Key words: city public passenger transport, management, price (tariff), quality of passenger transportation, survey.

DISTANTLY PILOTED AIRCRAFTS AND THE TRACK SECURITY

Lievin, Boris A., Bugaev, Alexander S., Ivashov, Sergey I., Razevig, Vladimir V.

pp. 152 – 157

The terrorist attacks attempts executed in Russia and abroad as well as probability of their repetition at high speed railways make it necessary to reinforce the measures of counteraction to those threats. The measures of control of the zone of tracks are engineered, including air monitoring and aerial photography, in order to ensure security of train traffic, to prevent possible acts of sabotage, immediate detection of explosive devices. The article is devoted to one of these measures, namely to remotely piloted aircrafts with optical sensors. The authors substantiate their advantages, demonstrate the results of the pilot researches, and offer comparison between airplane and helicopter type aircrafts, used for monitoring.

Key words: railway terrorism, explosive devices, air monitoring, security of traffic, monitoring of the track, remotely piloted aircrafts, aerial photography, optical sensors, experimental study.

DISTINCTIVE FEATURES OF THE ACCIDENTS OF TECHNOGENEOUS ACCIDENTS

Shevchenko, Anatoly I.

pp. 158 – 163

The author suggests assessment and classification of the dangers (threats) of emergencies of technogeneuous nature for the railway staff, passengers and residents of territories adjoining railway infrastructure. Particular attention is paid to probable threats emanating from waterworks, and to the requirements for the railway carriage of chemically dangerous goods (including poisonous). The author analyzes functions of the administration organs in the zones of emergencies, first of all those, concerning human protection, immediate alerting, and safety measures.

Key words: railway, safety, emergency, technogeneuous factors, classification, rules of behavior in dangerous zone.

SYSTEM OF LABOR PROTECTION AND PROFESSIONAL RISKS

Aksenov, Vladimir A., Raenok, Dmitry L., Zavialov, Anton M.

pp. 164 – 169

The modernization of the safety and labor protection system within Russian Railways is based on some new approaches, including the professional risks management. The article analyzes the results of a pilot project of professional risk management system implemented within the Oktiabrskaya direction of track repairs.

Key words: railway, labor protection system, professional risks management, human factor, expert method, methods approbation, pilot project.

EFFECTS FOR ATMOSPHERE OF COAL FIRING IN LAYERWISE BOILERS

Sidorov, Yuri P., Safronova, Daria S.

pp. 170 – 173

The article gives an assessment of negative effects for the atmosphere of solid fuels due to atmospheric emission of nitric oxide, sulfur oxide, carbon monoxide. The study is based on calculations for 19 grades of coal, lignite (brown coal), anthracite used in KEtype multilayer boilers with 2,5 to 25 ton/hour steam output. In order to facilitate comparison of emissions of polluting substance into atmosphere the notion of «eco-rates» assessment is used, which considers economic and ecological aspects

of prejudice, and the detailed conditions of heat power production at the enterprises that provide services to railways.

Key words: railway enterprises, heat supply, boilers, solid fuel, coal, specific fuel consumption, atmospheric emission, ecological rates.

INTERACTION BETWEEN GEOSYNTHETICS AND THE SOIL OF ARMED SOIL WALLS

Koustousov, Andrey N.

pp. 174 – 179

Reliability and strength of armed soil walls ensure safe operation of embankments, facilities and protective layers of subballast basement of railways. The study on interaction of reinforcing elements and the soil solves the problems of defining of the coefficients of such interaction along the surface earth – geosynthetic, of empirical dependence between the angle of internal friction of the soil and the coefficients of interaction for different types of geosynthetics.

Key words: railway, armed soil walls, geosynthetics, soil, earth, subballast basement, designing, reliability, interaction coefficient.

FULL-SCALE TESTING OF AXLE BOX TROUBLESHOOTING STATION

Martynov, Igor E., Petuhov Vadim M.

pp. 180 – 182

The department of railway cars of the Ukrainian state academy of railway transportation, taking into consideration the expertise of leading manufacturers of bearings for rolling stock, has engineered an onboard axle box troubleshooting station (ABTS). Its task is to discover defaults and to ensure traffic safety by monitoring the temperature of axle spindle of the wheel set, integrity of the end joint, the rotary speed of the wheels and by cumulating data on the temperature regime of the axle box, speed and mileage of the car. The authors describe the results of full scale testing of the built-in system of controlling of technical state of the axle boxes of freight cars that confirmed practicability of the use of suggested device and of the necessity of further operational tests stipulated by the standards.

Key words: railway, freight car, axle boxes unit, technical condition, safety, reliability, built-in test equipment, full-scale testing.

COORDINATION OF CORPORATE AND HIGHER SCHOOLS' CAPACITY FOR STAFF TRAINING

Mulenko, Olga V., Timofeev, Victor V.
pp. 184 – 187

The growing quality of training of employees of railways can be achieved through partnership between corporate university of JSC Russian Railways and transport universities, via strengthening of relations between employers and railway education system. The authors describe new approaches towards employment of graduates and their starting positions in the railway sector.

Key words: railways, training, integration of transport universities, corporate university, human resources, employers.

RESOURCES OF COMPETITIVENESS OF GRADUATES

Vlasuk, Galina V.

pp. 188 – 191

The author analyzes the problem of preparedness of graduates for independent and valuable competition at labor market, of their capacity to meet the growing requirement from behalf of the employers. On the one hand the syllabus misses practical focused skills, on the other hand there are superproduction of graduates with professions that are not demanded by the market and simultaneous deficiency of the competencies that are highly required by business. The issue is to search a due balance of offer and demand, of training quality and employability for a university graduate.

Key words: higher education, university, training, resources of competitiveness, competencies and skills role, university strategy, employer position, labor market, dialectics of demand, job placement of graduates.

COMPETENCE OF COMMUNICATION AND SPEECH

Bisikalo, Mira S.

pp. 192 – 196

Higher school education naturally supposes knowledge acquirement along with skills of civilized cultural behavior in the framework of professional activities of future graduate. The underestimated role belongs to competence of communication

and speech which finds its expression in business communications, vocabulary, ability to clearly formulate the thoughts and requirements.

Key words: business communications, competence of communication and speech, style, communication types, Russian language, vocabulary, anomalies of speech environment, role of education.

ELECTRIC PLANE BECAME THE VEHICLE OF PROGRESS

Grigoriev, Nickolay D.

pp. 198 – 205

90 years ago deceased the inventor of incandescent lamp, which till now maintains its features and engineering particularities. Russian electric engineer Alexander Lodygin was the author of many ideas, holder of tens of patents of different countries. His lamps replaced gas lighting in passenger coaches, were used as signal lamps at railways. He had occasions to engineer prototypes of helicopter and electric vehicle.

Key words: Lodygin, incandescent lamp, tungsten filament, electric plane, electromobile, inventions, city lighting, induction furnace, history.

TRANSPORT OF SLAVE-OWNING CIVILIZATION

Galahov, Valentine I.

pp. 210 – 222

Conclusion of the article (Mir Transporta Iss.6, 2012) on the water and inland vehicles, communications of the slave-holding civilization, scientific, technical and energy achievements of the period of 2000 BC till 900 AC.

Key words: transport, history, slave-holding civilization, evolution of means of transportation, communications, technics, energy, science.

THE SPEEDS OF TRAFFIC AND OF DECONTAMINATION

Makarova, Elena I.

pp. 224 – 227

Zubrev N.I., Zhuravleva M.A. Prevention of contamination of biosphere with heavy metals during high speed transport operation [Predotvraschenie zagryazneniya biosfery tyazhelymi metallami pri ekspluatatsii vysokoskorostnogo transporta].

Monograph. Moscow, UMTS ZHDT [Training and methodological center of railway transport], 2012, 272 p.

The reviewed monograph is dedicated to the problem of prevention of environment pollution with heavy metals during operation of high speed road and railway transport. The authors have systematized the sources of wastage, containing heavy metals, described the migration routes of heavy metals in biosphere and food chains. The book refers also to technogeneious anomalies at the enterprises providing services to traffic process and during the operation of rolling stock. The authors suggest modern and promising technologies which could be useful to reduce air, water and soil pollution.

Key words: ecology, railway, biosphere, hydrosphere, heavy metals, high speed routes, engineering chemistry, technology of decontamination, purifying.