ANNOTATIONS OF THE ARTICLES

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CHALLENGE OF MODERNITY

The paper describes a generalized vision of modern age challenge with which humanity has faced. The analogy between modernity and late Rome is presented; the author pays attention to formation of a new synthetic reality. Substantial elements of this reality are on the one hand - legacy of previous time, on the other hand - products of economic and information globalization happening nowadays. The world has become flat by value and breaks down into particular; in fact this is the challenge of our time. New semantic integrity of mankind should meet it.

Keywords: *modernity, challenge, society, civilization, culture.*

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DEVELOPMENT OF INVESTMENT PORTFOLIO MODEL

The paper studies various forms of portfolio's investment and portfolio structure development taking into account influence of profitability and risk factors.

The present research has actual importance due to the fact that on the one side the majority of projects needs investments, but on the other side nowadays everyone can become an investor considering IT and economic development.

Moreover mathematical analysis methods of investments profitability and riskiness are especially significant.

One of the methods to protect the investor from risks and to receive investment income is clever development of investment portfolio structure so that the set of assets could cover the risk of losses and give maximum profit in case of successful outcome.

Estimation and analysis of portfolio structure conducted with consideration of two main factors - profitability and risk, displayed by relevant well-known indexes.

The portfolio structure includes securities of various kinds, currency and precious metals. Besides the possibility of investment portfolio allocation partly for manipulations on stock exchange aiming at super-profits is considered.

Keywords: *investment portfolio, structure, profitability, volatility.*

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UP-TO-DATE DIRECTIONS OF OUTSOURCING DEVELOPMENT IN THE SPHERE OF INSURANCE SERVICES

The paper presents brief summary of the current situation in the field of outsourcing as well as some first-priority applied tasks (particularly outsourcing opportunities for insurance companies, search of quick results and long-term directions of development, and approaches to interaction between insurers and their outsourcing partners). Attention is focused on such questions as implementation of specific actions by insurance company with its partners, suppliers, contractors and consultants; actions planning in this directions. Substantiation of effective organizational structure for an insurance company allows quicker use of outsourcing for solution of the most different problems at lower cost.

As a result the effective approaches to outsourcing implementation for insurance services were determined and the complex understanding of efficiency and feasibility of outsourcing application for an insurance company is explored.

Keywords: *insurance, insurer, outsourcing, insurance services, expenses, risks.*

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INFLUENCE OF POWER INDUSTRY ON DEVELOPMENT OF ECONOMIC SPHERES

This paper studies influence of power consumption (including consumption per capita) on development of enterprises and industries. The authors reasonably prove the fact that power consumption is higher in countries with higher growth rates and consequently better living standards. At the same time in conditions of market economy the demand for energy is determined by the following main factors – level of economic development, energy efficiency, and price dynamics for energy carriers.

The carried-out SWOT analysis of economy industries in Orenburg Region has shown that structural economy adjustment shall be performed considering regional benefits in scientific, technical and personnel potential, superfluity of electricity generation that is attractive to potential investors.

The comparative analysis of energy consumption revealed that Russia is among the countries with high level of electric power consumption (5661 kWh/person) or 44,7% of the USA level and 72,5% of Japan level. In 2015 electricity consumption in Orenburg region equaled to 7776 kWh/person or 137,4% of average Russian level.

Keywords: *economic industries; consumption of energy resources; energy saving; technological modes; energy balance; social and economic development; factors of investment appeal.*

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FORMATION OF LOGISTIC DECISIONS IN MANAGEMENT OF TRANSPORT AND WAREHOUSING

Native and foreign scientists pay insufficient attention to comprehensive and system study of decision-making in management of logistics, transport and warehouse, that's why it's necessary to develop methodological support in this field. The purpose of this paper is development of methodical recommendations on formation of logistic decisions in management of transport and warehousing basing on administrative decisions' theory and logistic approach. The algorithm of logistic decisions formation in management of transport and warehousing was offered, its stages were considered, and tools of its implementation in the form of methods set were selected for each stage. By means of target approach, in particular «tree method», the author highlights optimization criteria of logistic streams – «quantity», «quality», «time», «place», «trajectory», «expenses» based on parameters for assessment of transport and warehousing conditions as well as management effectiveness. It allowed creating the main areas of transport and warehousing, where it is possible to define so-called - KPI (key performance indicators) in each allow monitoring development and its advance to the goals. The offered technique will promote effective administrative decisions for development of transport and warehouse system, growth of benefits, risks reduction and stability of its activity.

Keywords: *logistic approach, logistic decisions, management of transport and warehousing, diagnostics, objectives tree, KPI (key performance indicators), criteria and parameters of logistic streams optimization.*

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INDICATORS EVALUATING INNOVATIVE DEVELOPMENT OF KURSK REGION

The paper assesses innovation development results of Kursk region in comparison with the forecast of innovation potential presented in socio-economic development program of Kursk region for 2011-2015. Dynamics of entrepreneurial innovative activity in Kursk region is analyzed.

On the basis of the study the main macroeconomic trends influencing innovation component of national economy are identified; key factors of entrepreneurship development as well as crisis effect are highlighted. The key role of the state in development of innovative mechanisms corresponding to economic and social conditions is determined.

A number of laws regulating innovation field were adopted as a part of regional documents defining the vector of innovative economy over the past years; the system of development institutions and support infrastructure for innovation were created. Moreover improvement of tax treatment for innovative activities is carried out to promote spending on technological modernization. The tax burden of small and medium-sized innovative enterprises is reducing.

Keywords: *innovative potential, region, development, innovation.*

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DIFFERENTIATION OF RUSSIAN FEDERATION REGIONS ACCORDING TO CHARACTERISTICS OF EDUCATIONAL SPHERE

The paper examines characteristics of educational services for federal subjects of Russia. The rating of Russian Federation subjects is performed; the score parameters are calculated allowing to compare heterogeneous indicators. The variation of selected indicators is statistically assessed. In connection with the identified heterogeneity of RF subjects, the multidimensional classification by Ward's method allowed to obtain four homogeneous clusters. The maximum, minimum and average values of the analyzed attributes are calculate for these clusters. Statistical estimation and modeling of the factors influence on the characteristics of educational services is presented. Point and interval expected values of educational indicators are calculated according to obtained econometric models of multiple regressions. The results of econometric study show that the factors reflecting demographic processes and living standards have the great impact on the sphere of educational services.

Keywords: *sphere of educational services, multidimensional classification and rating assessment of federal subjects, econometric modeling of connections.*

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CONCEPTS OF SUSTAINABLE DEVELOPMENT AND CORPORATE SOCIAL RESPONSIBILITY IN MANAGEMENT OF TOWN-FORMING ENTERPRISE

The paper discusses management issues of a town-forming enterprise as the special social and economic object. The key characteristic of any town-forming enterprise is existence of close connection between enterprise activity and the territory by the authors' opinion. The proximity of this connection is defined by such factors as: income share coming from the town-forming enterprise, share of the enterprise employees in total number occupied in the town, geographical remoteness from alternative labor market. The authors note that town-forming enterprises solve problems of own development on the one hand, and support of acceptable living standards for local population on the other hand. It's considered that concept of sustainable development is one of the key

concepts of the town-forming enterprise management. The authors' definition of «sustainable development of town-forming enterprise» is presented. The corporate social responsibility (CSR) is explored as the alternative concept for management of the town-forming enterprise, as well as distinctions between sustainable development and CSR are revealed. The basic indicators characterizing development of the town-forming enterprise are defined within the chosen concepts.

Keywords: *town-forming enterprise, sustainable development, corporate social responsibility*

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FACTORS DETERMINING DEVELOPMENT OF RETAIL PAYMENT INDUSTRY

The paper discusses factors determining development peculiarities of payment instruments, as well as probability of innovations for different payment and settlement systems.

The factors influencing prevalence of different payment instruments are divided into three groups by the author. The first group of factors are macroeconomic (this group includes basic economic indicators such as GDP, income and expenditures, inflation, etc.), the second – innovative and technological, the third – cultural and psychological.

On the basis of research the author makes a conclusion about necessity of creation of favorable cultural and psychological environment in the current crisis, what will significantly accelerate the building process of a modern, high-tech and cost-effective industry of retail payments in the future.

Keywords: *payment industry, instruments of payment, formation factors, uncertainty conditions.*

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ECONOMETRIC MODELLING OF GDP PER CAPITA DYMANICS FOR BRICS COUNTRIES

The relevance of this topic is explained by activation of the international unions forming (European Union, CIS, the Customs Union, SCO, BRICS, etc.) directed to the change of power balance on the world political map. In this respect the purpose of the paper is comparison of dynamics for one of the key macro indicators - gross domestic product per capita. The leading study method of the considered issue is regression analysis describing a motion trajectory of the analyzed indicator by means of mathematical function. On the basis of estimated and tested dynamic models, the GDP (per capita) forecast of BRICS for 2015-2017 was presented. The received results can be used by researchers, specialists of the international organizations, employees of governmental bodies of BRICS members for policy forming aimed to integration.

Keywords: *BRICS, comparison, dynamics, econometrics, model, forecast.*

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INNOVATIVE METHODS OF PERSONAL EFFICIENCY INCREASE FOR A MODERN LEADER

The paper discusses innovative methods of personal efficiency increase for a modern leader. The authors analyze the concept of personal effectiveness, importance of continuous improvement of management skills, as well as the main ways of personal efficiency increase for modern leaders.

The paper explores management skills, communicative skills, principle of goal setting, technology of SMART objectives, Pareto principle, principle of ABC planning, Eisenhower matrix, «tomato» technique, delegation and time control technology to improve personal efficiency of modern leader. It is important to emphasize that the focus is on a dynamic aspect, on development of competencies and effectiveness of a person making management decisions.

It's necessary to note that ways of efficiency improvement are studied exactly for the professional sphere, but some of principles are quite applicable in other areas.

Keywords: *innovative methods, personal effectiveness, modern leader, management skills, communication skills, goal setting, SMART goals, Pareto principle, principle of ABC planning, Eisenhower matrix, technique of «tomato», delegation, time management.*

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STRUCTURE OF REGIONAL INTELLECTUAL CAPITAL

The paper deals with identification questions of structural components of regional intellectual capital and determination of functioning conditions and its formation mechanism. A comparative analysis of «intellectual organizational capital» and «regional intellectual capital» categories is performed as result of theoretical study. The author's definition of «regional intellectual capital» concept is presented and its distinctive features are identified.

Triangle structure of regional intellectual capital is proved on the basis of different approaches to structural models of intellectual capital. Considering study results, the structural and logical scheme of regional intellectual capital is presented. This scheme efficiency depends on regional level of infrastructural support forming spatial, informational, socio-economic environment resulting in intellectual regional capital as a whole.

Keywords: *regional intellectual capital, structure of regional intellectual capital, human capital, relational capital, structural capital, innovative development of region.*

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IMPROVING INTERACTION BETWEEN UNIVERSITIES AND INDUSTRIAL REGIONAL ENTERPRISES

The paper considers the issue of scientific and industrial interaction between higher educational institutions and industrial enterprises of the region. On the example of Orenburg State University it is shown that large regional universities saved up sufficient scientific potential to carry out necessary research for enterprises and fulfill a function of branch-wise research institutes. The currently existing forms of collaboration between enterprises and universities are specified, the integration project model "University-Science-Industry" is proposed. This model will allow students to pass all stages of innovation process during the study: research development, prototypes,

and commercialization of intellectual results. The need for involvement of executive authorities with integration of science and industry is emphasized; establishment of regional coordinating center is justified, as well its functions and objectives are described.

Keywords: *science, industry, integration, issues, forms of interaction, coordination.*

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APPLICATION OF US OIL TNCS CAPITALIZATION STRATEGY IN RUSSIAN PRACTICE

The paper compares development models of oil and gas transnational companies (TNC) in the USA and Russia. Moreover the author evaluates the economic conditions in both countries and prospects for using the experience of Anadarko Petroleum, ConocoPhillips, Chevron, Occidental Petroleum and ExxonMobil by the largest oil and gas corporations of Russia such as PJSC «Gazprom», PJSC «NK «Rosneft» and PJSC «LUKOIL». The study is based on such data sources as FT Global 500, the World Bank, the Bank of Russia, Ministry of Economic Development (MED) of Russian Federation and official reports of oil and gas companies. Such information may be found in the specialized literature quite rarely.

Based on results, a scenario analysis of capitalization changes in the largest oil and gas Russian TNCs in case of existing situation preservation, using the experience of US TNCs and transition of the Russian economy to a new development model (presented in the forecast of MED RF) is identified.

Keywords: *market capitalization, US and Russian gas-and-oil producing industry, capitalization strategy, Occidental Petroleum, Anadarko Petroleum, ConocoPhillips, Chevron, ExxonMobil, PJSC «Gazprom», PJSC «NK «Rosneft», PJSC «LUKOIL».*

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SOCIAL IMITATION: BACKGROUNDS AND GENESIS

This paper is devoted to research of background and genesis of imitation phenomenon. It has been argued that imitation phenomenon presents an essential element of the public life. It's noticed that imitation was not used with such definition in life of traditional societies as in life of modern societies. Nowadays phenomenon of social imitation is common not so much for private life of people, their reclaiming and reproducing of ancestors' cultural heritage as for production and commercial processes. Distribution of social imitation happened and happens in cultural public life with increasing speed. Today public conscience suffers a change caused by imitation, which expansion gives rise to generation of warped conception on true state of affairs and possibilities of their change. In former times such processes could promote social development of human and humanity. Nowadays they lead to

substitution of true reality understandings for more attractive concepts. In this case apperception of environment is displaced by unconscious perception.

Keywords: *imitation, society, virtual reality, imitation practices, social technologies, socio-cultural reality, original, imaginary, consciousness, fake, borrowing, tradition.*

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INSTITUTIONALIZATION OF DIALOGUE AMONG CIVILIZATIONS

The article deals with the issue of historical development of dialogue among civilizations, characterized by thickening of its institutional forms at every stage of development (before-institutional, pre-institutional, institutionalization, post-institutional). Institutionalization as the process and result of legitimizing and stabilizing of social institutions and relations is considered as the most important internal feature of civilization communication phenomenon. Nowadays the term «institutionalization of civilizations dialogue» gained its official international legitimacy and is recognized as a worldwide social and political need by international community. The author compared foreign (S. Huntington, P. Berger, T. Luckmann) and national (A.V. Zaitsev, O.V. Inshakov, S.S. Frolov) approach to the nature and specifics of phenomenon of civilizations dialogue institutionalization. The geopolitical future of humanity is revealed in the following possible scenarios of civilization: negative (war of civilizations); globalist (junction of civilizations); pragmatic (competition and dialogue of civilizations).

Keywords: *dialogue of civilizations, institutionalization, institutes, institutions, legitimization, implementation, multi-polar world of civilizations.*

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CREATION OF AGGREGATED PUBLICATIONS LISTS BASED ON RSCI AND SCOPUS DATA

The paper considers creating issue for aggregated list of publications citing RISC systems and SCOPUS. The relevance of this issue is the lack of software tools forming an aggregated list of authors and publications based on the data from citation different systems. The authors describe the following disadvantages of existing software tools: disregard of RSCI data and absence of automatic removal tools of duplicate publications. Various algorithms for imprecise string comparison to detect duplicate publications are considered. The set-up of algorithm pReferences on the training data set is performed. The quality and speed of algorithms are measured based on the test data set. Accessible quality and high operation speed of shingles algorithms are shown. An algorithm forming aggregated list of publications is proposed on the basis of existing shingles algorithm.

Keywords: *Aggregated list of publications, algorithms for imprecise string comparison, shingles algorithms, citation system, publication activity of authors.*

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DATABASES SEMANTIC MODELING OF FRAME – SLOT NORMAL FORM

This paper is devoted to implementation of an object-oriented approach for designing of automated information systems based on improvement of conceptual modeling of relational databases. The proposed method is based on the process of describing conceptual model in the form of a semantic network, containing frames and slots as vortex. The object-oriented software fully implements the chosen method of information processing. The one-dimensional arrays arranged in hypercubes do not require normalizing structures of relational databases. The concept of a primary key in relation to databases isn't implemented. For communicating between the object application and data arrays, the indicators in slots and frames links are used instead of a primary key. The interaction between objects of the automated information system with arrays of data in the form of hypercube, interpreted on the basis of frame-slot normal form, was modeled. Databases semantic modeling is approved in qualimetric analysis systems of production and services quality: cars, computers, teachers' work what confirms productivity of the offered approach to conceptual modeling of automated systems databases.

Keywords: *automated information system, database, conceptual modeling, semantic networks, frames, slots, information and logical database model.*

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FORECASTING SYSTEM OF FLOODING

This research is aimed to theoretical justification of the concept of floods forecasting system as well as to reasonable analysis of its practical implementation.

The paper discusses the relevance of research topic, existing systems shortcomings and economic justification of the project. The practical value of this work should be understood in the sphere of several aspects of human life preservation. First, development of forecasting system allows planning of people evacuation from flooded areas. Second, the system calculates required work-force, equipment and costs for evacuation. And third, it minimizes economic losses and reduces financial resources for infrastructure reconstruction.

The aim of this study was determination of the most appropriate forecasting method, performed by comparative analysis of advantages and disadvantages as well as applicability in the framework of the current task. Mathematical tool of neural networks was chosen as the mathematical system for forecasting due to comparative analysis.

Keywords: *forecasting, flood, flooding, analysis, forecast.*

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INITIAL STAGE OF CREATING INFORMATION EXPERT SYSTEM FOR MEDICAL DECISION-MAKING

The paper deals with organization and implementation of intellectual expert system (IES) - an information system, using expert knowledge to provide effective decision-making in medicine or other areas. This knowledge and experience of the experts (specialists in their sphere) will be set up in the knowledge base that represents a set

of inference rules. Thus IES (including the knowledge base) in general should be addressed to the following tasks: data interpretation; diagnostics; monitoring; decision support in one specific area.

This system will operate in two modes: acquisition of knowledge (teaching and learning system) and tasks solution (also called a consultation mode). The implementation of such knowledge may be required particularly in cases of decision-making, which are complex and non-obvious.

IES as a software system should have the following properties: the software should use a reasoning mechanism, which may be presented in the form of pairs of packages and conclusions with the «if – then» type; the system should comment on problem solution in user friendly way; the program output should be qualitative rather than quantitative; the knowledge base system should be open and scalable; the system is able to learn, that is, the knowledge base compensation should be accompanied by improvements in the efficiency of its operating.

Keywords: *intellectual expert system, method of association rules, Bayesian method.*

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DEFINING PARAMETERS OF PEDESTRIAN WAYS COSNIDERING NEEDS OF DIFFERENT POPULATION GROUPS

A comfortable pedestrian infrastructure for movement of all citizens groups including people with limited mobility (PLM) is one of the elements of qualitative urban environment. The analysis of local and foreign papers showed a lack of methods for calculating of pedestrian path parameters ensuring comfortable and safe motion for both individual PLM and mixed pedestrian flows. The paper describes calculating method for the width of walking lanes for specific pedestrian groups, based on the spatial external dimensions of a moving pedestrian, as well as for multi-lane pedestrian pathways considering imposition of the spatial dimensions of pedestrians moving in adjacent lanes. On its basis the proposals to amend a number of normative legal documents defining the width of pedestrian lanes are given.

Keywords: *pedestrian path of movement, width of pedestrian line, people with limited mobility.*

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IMPROVEMENT OF TRUCKS TECHNICAL SERVICE EXPLOITED IN NORTHERN REGIONS OF RUSSIAN FEDERATION

The paper presents results of methodology development for improvement of trucks technical service in the regions of Siberia and Far North, based on failure prediction using continuous monitoring of operating conditions and technical changes. This methodology based on multi-dimensional analysis allows data collection by means of internal diagnostics and IT, forecasting failures of the most important parts and schemes of a truck, what leads to reduction of expenditures for maintenance and repair, as well as increase of operational safety. The article deals with the OLAP model of process approach for servicing organization of «N3 category» automobiles at service and operational stations at regions of Siberia and Far North. This model improves organization and monitoring technology of trucks operating conditions and changes of maintenance planning.

Keywords: *technical service, extreme operating conditions, northern performance of trucks, technical hardness, monitoring system, OLAP-cube, multidimensional analysis, process.*

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ANALYTICAL METHOD FOR IDENTIFICATION OF SIGNAL SPECTRUM WITH IRREGULAR SAMPLES

The paper argues nonlinear changing of a captured signal's timescale within analysis screen for problem-solving of intense noisy signals' identification constituting fluctuations with monotonically varying frequency, containing information for instance about an object motion – in navigation systems. Variable-based transformation of timescale allows adjusting maximum energy of a window signal within appointed frequency range and provides an increase of system resolution generally; but on the contrary a signal will have variable-rate sampling as a result of time warping. This scientific article deals with spectral analysis' problem-solving of a window signal with variable-rate sampling. The paper's baseline presents methodology and computational algorithms for Newton's polynomial approximant of (window) signal samples with variable-rate sampling at a finite time interval. Spectrum function in the form of spectral density as the outcome of the Fourier integral is represented for a polynomial approximant – Newton's polynomial for instance. Based on the Fourier integral' determination the linear spectrum for captured samples' array of a signal with variable-rate sampling is formed. The obtained method for discrete Fourier transformation allows carrying out digital spectrum analysis of signals – in contrast to classical discrete Fourier transformation – with sampling irregular by time providing high accuracy. The paper comes with exemplification by way of approach's illustration developed by the authors.

Keywords: *window signal, polynomial approximant, matching calculation, digital spectrum analysis.*

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ACCURACY AND STABILITY OF TECHNOLOGICAL PROCESS ON THE BASIS OF CORRECT STRATEGY FOR EQUIPMENT RECOVERY

A construction methodology of hierarchical systems for administrative control of technological equipment is presented as the basis for products and productivity tools quality improvement. The paper describes optimization methods of technical maintenance and repair of technological equipment, based on the analysis of accuracy and stability of technological processes. The control system is based on universal scheme of technological process including the main factors influencing its accuracy. The order of production areas completing by machines with subsequent organization of repair is designed to ensure the continuity of the production process. The network model of production area operation is presented for the same type machines. In this model the periodic machines repair is performed in accordance with diagnostic results. The sequence of analytical diagnosis is given based

on results of machine accuracy check. An example of diagnosis and planning of preventive repairs for milling machines is explored.

Keywords: *analysis of accuracy and stability of technological processes (operations), optimal strategy of technological equipment maintenance and repair, system of equipment preventive control.*

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EFFECT OF HEAT TREATMENT ON STRENGTH OF DRIVING ROLLER CHAINS' PLATES

The paper deals with evaluation of heat treatment impact on plates strength of roller chains, widely used in various driving systems (for example, in motor vehicles, technological equipment of oil and gas industry, machine tools and etc.). One of the parameters characterizing chain strength is breaking load of the chain in general (and chain plates in particular), depending on the method of hardening processing. The experiments data on estimates

of static strength for plates of two inner versions of single-row driven roller chain with a pitch of 25.4 mm is presented (the plate 1 of producer «A» and modified plates 2 of manufacturer «B» have different thickness, are heat-treated at different modes on the factory «B» and in the laboratory of Materials Science and Metal Technology Department of Orenburg State University with hardness ensuring close to parameters of producer «A»). It is revealed that material hardness values of chains plates after appropriate heat treatment can be used for comparative evaluation of plates strength and assignment of test conditions and chains exploitation.

Keywords: *roller chain, chain plate, heat treatment.*

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