ANNOTATIONS OF THE ARTICLES

M.N. Kozin,

Doctor of Economic Sciences, Professor, Chief Researcher, Research Institute of the Federal Penitentiary Service of Russia

FORMATION OF THE RISK MANAGEMENT ALGORITHM ON THE OBJECTS OF SOCIAL INFRASTRUCTURE FROM THREATS OF NATURAL AND TECHNOGENIC CHARACTER

Modern approaches to managing the safety of social infrastructure do not allow implementing an integrated approach to managing risks from natural and man-made threats. Since the main goal is to achieve an optimum level of risk taking into account socio-economic, environmental and other aspects, the risk management is designed to minimize the negative impact on social infrastructure and human health, while minimizing the necessary costs. The proposed algorithm of the method includes: structural and morphological model of the system («person - object of social infrastructure – environment»); systematization, identification of man-caused and natural dangers and evaluation of their consequences; analysis of integral risk; risk modeling; assessment of the probability of identified technogenic hazards; analysis of consequences; procedure for calculating, assessing and comparing risk; risk handling. The economic interpretation of the developed algorithm is to solve the task of optimizing the costs of risk prevention by applying various modifications of objective functions and conditions when the level of control is changed.

Keywords: risk, algorithm, management, social infrastructure, threat.

References

1. Brown, D.B. Analysis and development of safety measures providing systems: [translated from English] / D.B. Brown. – Moscow: Mechanical Engineering, 1979. – 359 p.

2. Bykov, A.A., Murzin, N.V. Analysis problems of the man, society, nature safety / A.A. Bykov, N.V. Murzin. – St. Petersburg: Science, 1997.

3. Wentzel, E.S. Operations research. Tasks, principles, methodology / E.S. Wentzel. – Moscow: Science, 1980. – 208 p.

4. Vigdorovich, V.I. Technogenic risk: problems and solutions / V.I. Vigdorovich // Bulletin of the Tambov University. Series: Natural and technical sciences. – 2004. – Vol. 9. – Vol. 4. – pp. 405–419.

5. Kotar, O.K., Nosov, V.V. Optimum value of regional budget support for agricultural risk insurance / O.K. Kotar, V.V. Nosov // Ostrovsky readings. – 2016. – Vol. 1. – pp. 359–363.

6. Maksimova, T.V., Petrov, D.S., Shuisky, V.F., Lvutina, N.V., Nesterenko, E.G. Some Aspects of Analysis of Technogenic Ecological Risk / T.V. Maksimova, D.S. Petrov, V.F. Shuisky, N.V. Lvutina, E.G. Nesterenko // Mining Information-Analytical Bulletin (Scientific and Technical Journal). – 2004. – Vol. 12. – pp. 128–133.

7. Marukhlenko, A.L., Marukhlenko, S.L. Mathematical model of the system approach for the risk assessment of man-made accidents / A.L. Marukhlenko, S.L. Marukhlenko // Proceedings of the Southwest State University. Series: Management, Computer Science, Informatics. Medical instrument making. – 2013. – Vol. 2. – pp. 60–64.

8. Musaev, V.K. Analysis of the risk in the safety of the population and territories of economic objects from natural and technogenic emergency situations / V.K. Musaev // Problems of the Russian Society Safety. – 2012. – Vol. 3. – pp. 32–37.

9. Nosov, V.V. Modeling of the optimal structure of the agricultural organization production in the conditions of weather risk / V.V. Nosov // Bulletin of the Samara State Economic University. – 2010. – Vol. 1 (63). – pp. 57–63.

10. Risk assessment in the hierarchical structures of crucial objects / A.A. Kononov, K.V. Chernysh, D.S. Gurevich, A.K. Polikarpov // Proceedings of the ISA RAS / under the editorship of D.S. Chereshkin. – Moscow: LENAND, 2010. – Vol. 52. – pp. 5–15.

11. Shkarupeta, E.V. Economic Consequences of Emergencies in Modern Russia / E.V. Shkarupeta // Problems of Ensuring Security in Eliminating the Consequences of Emergencies. – 2015. – Vol. 1. – pp. 4–6.

V.M. Voronina,

Doctor of Economic Sciences, Professor at the Department of the economic management of the organization, Orenburg State University

DYNAMICS OF THE OUTPUT OF MAIN TYPES OF PRODUCTION IN THE RUSSIAN MECHANICAL ENGINEERING AS CHARACTERISTIC OF THE INDUSTRY CONDITION

Devaluation of the Russian ruble in 2014 has resulted in understanding of size of loss of the commodity safety on many positions; especially, this problem is particularly acute in mechanical engineering production. When carrying out this research, the general scientific methods (the deduction and induction, the analysis and synthesis) and statistical methods (graphic, tabular and coefficient) have been used. In this regard the purpose of this article is the analysis of the mechanical engineering condition during 1990-2015. The main results have been achieved: the level of loading of machine-building production in Russia has been analyzed; the tendencies of the indicator decreasing for the last 25 years were revealed; the outputs of the major types of production in the main directions of the mechanical engineering have been considered; the conclusions about the failure depth in the industry and the size of lag from the reached «tops» in the Soviet period of the country development are formulated. The received results will be useful to researchers in the field of industrial production in Russia and to the ministries and departments to develop the strategy of bringing the industry out of crisis.

Keywords: industry, dynamics, structure, output, main types of production, production capacity, mechanical engineering economy, state, development.

References

1. Bodrunov, S.D. State and tendencies of development of mechanical engineering in Russia / S.D. Bodrunov // Economic revival of Russia. – 2012. – Vol. 3 (33). – pp. 16–18.

2. Voronina, V.M. Economic indices of the activities of the industrial enterprise and ways of their improving: applied aspects / V.M. Voronina, O.V. Fedorishcheva // Formation of market economy: theory and practice. Collection of scientific articles. – Orenburg, 2015. – pp. 39–44.

3. Zakharova, T.S. State and tendencies of development of mechanical engineering in Russia / T.S. Zakharova // Innovative science. – 2016. – Vol. 3–1. – pp. 101–105.

4. Kozlova, E.P. Assessment of the perspective directions of development of mechanical engineering branch / E.P. Kozlova // Bulletin of the Saratov State Social and Economic University. – 2014. – Vol. 1 (50). – pp. 54–56.

5. Krasnopevtseva, I.V. Retrospective analysis of development of domestic engineering industry / I.V. Krasnopevtseva // Bulletin of the Volga State Technological University. Series: Economy and management. – 2013. – Vol. 2 (18). – pp. 44–53.

6. Mandzinovska, Kh.O. Integrated approach to the analysis and evaluation of financial and economic activity of machine-building enterprises / Kh.O. Mandzinovska // Business inform. – 2015. – Vol. 2. – pp. 156–161.

7. Mukhanova, I.V. Modernization of mechanical engineering in Russia in the conditions of economic sanctions: problems and solutions / I.V. Mukhanova // Economic Journal. – 2015. – Vol. 2. – pp. 34–41.

8. Steblyakova, L.P. Application of methods of the multidimensional comparative analysis to the assessment of structural changes in mechanical engineering / L.P. Steblyakova // Works of University. – 2004. – Vol. 1. – pp. 78–82.

9. Timofeev, D.N. Studying of development of the industry in Russia in 1930-2011 years using statistical methods / D.N. Timofeev, A.P. Tsypin // Economic revival of Russia. – 2014. – Vol. 1 (39). – p. 54.

10. Tsypin, A.P. Comparison of the growth (decrease) rates of the industrial production in Russia and the USA in 1970-2010 years / A.P. Tsypin, V.A. Ovsyannikov // Intelligence. Innovations. Investments. – 2016. – Vol. 1. – pp. 41–45.

J.V. Gnezdova,

Doctor of Economic Sciences, Professor at the Department of Economics, Smolensk State University

DEVELOPMENT OF DIGITAL ECONOMY IN RUSSIA AS A FACTOR OF GLOBAL COMPETITIVENESS INCREASE

In the article the tendencies of the digital economy development in Russia are considered, it becomes more and more important driving force of the global economic growth and plays a significant role in the rates acceleration of the economic development, in the productivity increase of the existing branches, in the formation of new markets and branches and in the achievement of the inclusive steady growth, recommendations for the growth of the digital economy are also made. The purpose of the work is to show that the growth mode of «the economy based on knowledge» is concentrated on the scientific and technical achievements, which are embodied in the conceptual innovations in all sectors of economy. For this reason «the economy based on knowledge» is characterized by experts as the innovative economy. The relevance of this work is proved by the fact that the digital economy is promptly and globally developing and is the most important engine of the innovations, competitiveness and economic growth in the World. At the present stage of the world economy development the informatization level of the society and business is of great importance. The following research methods were used: studying and

generalization methods, analysis and synthesis. These methods allow making a logical study of the collected facts, to develop concepts and judgments, to do conclusions and theoretical generalizations.

Keywords: *digital economy, economic development, Internet space.*

References

1. Bao, Ou Innovation – driving force of development of the Chinese society in present period / Ou Bao // Problems of the Far East. – 2002. – Vol. 4. – pp. 95–109.

2. Borevskaya, N.E. Epoch of «the economy of knowledge» / N.E. Borevskaya // Search. – 2001. – Vol. 26. – p. 10.

3. Varyash, I.Y. Long-term money of economy knowledge / I.Y. Varyash, V.L. Makarov // Banking. – 2004. – Vol. 12. – pp. 48–50.

4. Vlasov, M.V. Strategy of new knowledge production / M.V. Vlasov // Social sciences and modernity. – 2007. – Vol. 3. – pp. 18–22.

5. Dobrynin, A.P. Digital economy – various ways to the effective use of technologies (BIM, PLM, CAD, IOT, Smart City, BIG DATA and others) / A.P. Dobrynin and others // International Journal of Open Information Technologies. – 2016. – Vol. 4. – Vol. 1. – pp. 4–11.

6. Russia needs the strategy of the digital economy development [Electronic resource] – Access: https://ria.ru/economy/20160618/1449119769.html – (reference date: 04.04.2017).

7. Bridges news [Electronic resource] – Access: http://www.ictsd.org/bridges-news – (reference date: 04.04.2017).

8. Veselovsky, M.Y. Formation of management system for sustainable development of enterprises in the various industries / M.Y. Veselovsky, J.V. Gnezdova, M.A. Menshikova, M.A. Izmailova, J.A. Romanova // International Journal of Applied Engineering Research. – 2015. – Vol. 10. – Vol. 20. – p. 41172. (11).

9. Veselovsky, M.Y. Mechanism of use of public and private partnership in order to develop the innovative economy / M.Y. Veselovsky, J.V. Gnezdova, M.A. Menshikova, M.A. Izmailova, J.A. Romanova // Journal of Applied Economic Sciences. – 2015. – Vol. X. – Vol. 5. – p. 625 (10).

10. Digital economy [Electronic resource] – Access: http://ec.europa.eu/growth/sectors/digital-economy/importance/index_en.htm –(reference date: 04.04.2017).

D.A. Kuzin,

Candidate of Economic Sciences, Associate Professor at the Department of national and world economy, Sochi Institute (branch) of Peoples' Friendship University of Russia

A.S. Kuzin,

Leading engineer at the Department of property complex management, Orenburg State University

ECONOMETRIC MODELING OF INFLUENCE OF THE HUMAN CAPITAL AND FIXED ASSETS COST ON GROSS REGIONAL PRODUCT

The relevance of the chosen subject is caused by the increase of the role of the education level and professional skills of workers in the modern hi-tech economy. The purpose of the conducted research consists in the statistical studying of the human capital influence on the economies efficiency of the subjects in the Russian Federation. In this work such methods of the economical and statistical analysis as graphic, tabular, correlation and regression and cluster analysis were used. The main results were achieved: the stratification of set of subjects on groups on the level of results and factors of production is proved; the domination of various elements of national wealth in the pointed subsets is established. The received results will be useful to researchers in the field of labor market, and also to officials in the Ministry of Labor and Social Protection of the Russian Federation when forming the strategy directed to decrease the imbalance of labor supply and demand on the territory of the country.

Keywords: *human capital, labor power, variation, differentiation, econometric modeling.*

References

1. Babordina, O.A. Role of human resources in the increase of efficiency of modern production / O.A. Babordina, M.P. Garanina // Economy and property management. – 2016. – Vol. 4. – pp. 15–23.

2. Degtyareva, T.D. The intellectual capital of the region as a factor of formation of innovative economy / T.D. Degtyareva, D.A. Kuzin // Materials I All-Russian symposium on regional economy / Office of social sciences of RAS; Institute of Economics, the Ural Branch of Russian Academy of Sciences; Russian Fund of Basic Research. – 2011. – pp. 31–34.

3. Korabeynikov, I.N. Research of the problem of new knowledge production / I.N. Korabeynikov, Zh.A. Ermakova, A.A. Sinyukov // Bulletin of the Orenburg State University. – 2011. – Vol. 5 (124). – pp. 48–52.

4. Kuzin, D.A. Investments into the human capital as a factor of economic growth / D.A. Kuzin // Intelligence. Innovations. Investments. – 2016. – Vol. 6. – pp. 31–35.

5. Kuzin, D.A. Policy of the high-quality economic growth and its consequences / D.A. Kuzin // Bulletin of the Orenburg State University. – 2009. – Vol. 5 (111). – pp. 47–49.

6. Nosov, V.V. Modeling of the factors influence on the Gross Regional Product on the basis of artificial neural networks / V.V. Nosov, A.P. Tsypin // Scientist of the 21st century. – 2016. – Vol. 1 (14). – pp. 40–43.

7. Opaleva, O.I. Influence of the human capital on modernization of the Russian economy / O.I. Opaleva // Bulletin of the Moscow State Regional University. Series: Economy. – 2015. – Vol. 1. – pp. 19–23.

8. Osipov, V.S. System approach to the intensive development of the domestic economy / V.S. Osipov, R.A. Khalturin // Economic sciences. – 2013. – Vol. 100. – pp. 7–10.

9. Pankova, S.V. Modeling of the socio-economic factors influence on Gross Regional Product / S.V. Pankova, A.P. Tsypin // Economic analysis: theory and practice. – 2015. – Vol. 45 (444). – pp. 2–14.

10. Tazhudinova, D.A. Human capital as resource of economic growth / D.A. Tazhudinova, H.H. Mutalimova // Economy and business. – 2016. – Vol. 1–1 (66–1). – pp. 550–553.

11. Chechina, O.S. Interrelation of the principles and methods of the human capital management for the innovative development of branch economic system / O.S. Chechina // Scientific review. – 2015. – Vol. 1. – pp. 221–226.

12. Sultanova, A.V. Human capital as a key factor of economic growth in crisis / A.V. Sultanova, O.S. Chechina // European Research Studies Journal. – 2016. – Vol. 19. – Vol. 2. – pp. 71–78.

13. Forrester, S.V. Human capital in the innovative conditions / S.V. Forrester and others // IEJME: Mathematics Education. – 2016. – Vol. 11. – Vol. 8. – pp. 3048–3065.

V.S. Osipov,

Doctor of Economic Sciences, Chief Researcher at the Federal Research Institute of System Analysis of the Accounts Chamber of the Russian Federation (NII SP), Institute of Economics at the Russian Academy of Sciences

ROLE OF THE IMPORT SUBSTITUTION IN FORMATION
OF THE NEW DEVELOPMENT MODEL

The intensification of Russian industrial policy against the economic sanctions imposed on it and the response to the food embargo forced the search for approaches to the implementation of long-term industrial policy mechanisms.

The author suggests turning to the experience of those countries which, on the basis of import substitution recipes, managed to overcome the way from the «third world» countries to the «first» ones. Summarizing the experience of implementing the policy of import substitution and industrialization makes it possible to point the common features of such policy and to outline the mechanisms for implementing the industrial policy in the conditions of forced protectionism.

The stages of the industrial policy based on the import substitution, the characteristics of these stages, restrictions in the import substitution policy, as well as the institutional bases of the import substitution policy based on the coefficient of the capitalist system are shown.

Based on the data of Russian statistics it is shown that while the import substitution policy has not shown significant results, but its continuation is necessary. Consecutive and progressive implementation of the identified stages of the import substitution policy will lead to the cultivation of national champions - enterprises capable of producing product that will be competitive on the international market. With the help of the capitalist factor, it has been shown that the formation of favorable institutional conditions for business development is the initial starting point for the beginning of the industrial policy implementation.

The article is intended for officials who make state decisions in the field of the industrial policy, as well as for all those interested in the import substitution.

Keywords: *import substitution, industrial policy, sanctions, coefficient of the capitalistic system.*

References

1. Evseev, V.O. Industrial policy of Russia: political and economic and regional aspects: monograph / V.O. Evseev and others. – Moscow: Scientific book, 2016. – 192 p.

2. Zel'dner, A.G. Public-private partnership is a mainstream of the present stage of the Russian economy / A.G. Zel'dner // World of changes. – 2014. – Vol. 1. – pp. 140–143.

3. Zel'dner, A.G. Essence and sources of the destructive tendencies in the economic system of Russia / A.G. Zel'dner // Economic sciences. – 2013. – Vol. 101. – pp. 7–13.

4. List, F. National system of political economy / F. List. – Moscow: Publishing House «Europe», 2005. – 382 p.

5. Mjurdal', G. World economy / G. Mjurdal'. – Moscow: Publishing House of foreign literature, 1958. – 556 p.

6. Mjurdal', G. Modern problems of «the third world» / G. Mjurdal'. – Moscow: Publishing House «Progress», 1972. – 768 p.

7. Osipov, V.S. Directions of the agrarian and industrial policies in Russia: from sanctions to the competitive import substitution / V.S. Osipov // Nikonov Readings. – 2016. – Vol. 21. – pp. 113–115.

8. Osipov, V.S. Institutional analysis of the dysfunctions of the economic public administration / V.S. Osipov, A.G. Zel'dner, R.I. Shirjaeva, I.R. Kurnysheva, V.V. Sechenova. – Moscow, 2016. – 206 p.

9. Rejnert, E.S. Spontaneous Chaos. Recession era economy / E.S. Rejnert. – Moscow: ROSSPEN, 2017. – 190 p.

10. Skryl', T.V., Osipov, V.S. Sustainable economic development: aspects of industrial policy / T.V. Skryl', V.S. Osipov // Economy and business. – 2016. – Vol. 1–2 (66–2). – pp. 719–726.

11. Shvab, K. Fourth industrial revolution / K. Shvab. – Moscow: Publishing House «E», 2017. – 208 p.

12. Tsypin, A.P. Influence of the industry condition on the food security of the region / A.P. Tsypin // Azimuth of scientific researches: economy and management. – 2016. – Vol. 5. – Vol. 3 (16). – pp. 209–211.

13. Hirschman, A.O. The political economy of import-substituting industrialization in Latin America [Electronic resource] / A.O. Hirschman // Quarterly Journal of Economics. February. – 1968. – Access: https://doi.org/10.2307/1882243 – (reference date: 22.01.2017).

14. Kosov, M.E. Socio-Economic Planning of the Economy / M.E. Kosov, R.G. Akhmadeev, V.S. Osipov, Yu.K. Kharakoz, I.I. Smotritskaya // Indian Journal of Science and Technology. – 2016. – Vol. 9. – Vol. 36. – pp. 102–108.

15. Mason, E.S. The Economic and Social Modernization of the Republic of Korea / E.S. Mason, M.J. Kim, D.H. Perkins, K.S. Kim, D. Cole, L. Jones, I. Sakong, D.R. Snodgrass, N.F. McGinn. – Cambridge, 1980. – 125 p.

16. Onimode, B. Imperialism and Underdevelopment in Nigeria. The Dialectics of Mass Poverty / B. Onimode. – L., 1982. – 177 p.

17. Osipov, V.S. The Strategic Directions of the Modern Russian Economic Development / V.S. Osipov, T.V. Skryl // International Business Management. – 2016. – Vol. 10. – Vol. 6. – pp. 710–717.

18. Reinert, E. Handbook of Alternative Theories of Economic Development / E. Reinert, J. Ghosh, R. Kattel and others. – Cheltenham: Elgar, 2016. – 786 p.

Y.N. Soina-Kutischeva,
Candidate of Economic Sciences, Associate Professor at the Department of Management and Marketing, Novokuznetsk Institute (Branch), Kemerovo State University

V.V. Cherkasova,
Lecturer at the Department of Economics, Finance and Accounting, Novokuznetsk Institute (Branch), Kemerovo State University

I.Y. Melnikova,
Candidate of Economic Sciences, Associate Professor at the Department of Management and Marketing, Novokuznetsk Institute (Branch), Kemerovo State University

**DIVERSIFICATION OF ACTIVITY AS A METHOD
OF INCREASING THE BUSINESS EFFICIENCY**

At the present time the problem of business efficiency is very important. The decision of this problem is one of the conditions for getting out of the crisis both at the level of the separate enterprise, and at the level of national economy in general.

There are a lot of ways to improve the effectiveness of the organization in the theory and practice of economics and management. One of these ways is diversification. The aim of this research is to study the specifics of business diversification as a strategy of its development. Following methods were used in this research: analysis of scientific, educational and reference literature on diversification problems, mathematical methods for assessing the level of the company controllability. As a result, the definition of the organization diversification has been clarified and a classification of its types has been proposed. On the example of the large construction company in the Kemerovo

region the tendencies of business diversification are considered and the general assessment of its efficiency is given. The possible ways of horizontal, vertical and cross diversifications of this company are elaborated: construction of mobile production facilities, production of alumina-silicate hollow microspheres, production of commercial products from recycling. The main provisions and conclusions of the article can be used in the scientific and pedagogical activity when considering questions about the feasibility of business diversification.

Keywords: *diversification of the organization, types of diversification, construction company, efficiency of diversification, directions of the construction company diversification.*

References

1. Belous, A.B. The theory of controllability of the firm: monograph / A.B. Belous. – St. Petersburg: Publishing House of the St. Petersburg Academy of Management and Economics, 2010. – 304 p.

2. Belousova, V.M. Diversification of ferrous metallurgy companies in Russia: theoretical and practical aspects / V.M. Belousova // Discussion. – 2014. – Vol. 7 (48). – pp. 31–42.

3. Gerasimov, S. The state and prospects of the Russian construction industry in 2016–2017 [Electronic resource] / S. Gerasimov. – Access: http://www.indexbox.ru/news/sostojanie-i-Perspektivy-stroitelnoj-otrasli-rf/ – (reference date: 12.04.2017).

4. Jitlukhina, O.G. Problems of evaluating the economic efficiency of corporations with its diversification in the form of groups of companies / O.G. Jitlukhina, O.L. Mihaleva // Modern state and prospects of development of accounting, economic analysis and audit: Materials International scientific and practical conference 18 April 2014, Irkutsk / Federal State Budgetary Educational Institution of Higher Education «Baikal State University». – Irkutsk, 2014. – pp. 238–247.

5. Composite materials with controlled porosity / A.D. Zhukov, I.V. Bessonov, A.N. Sapelin, R.M. Mustafaev // Industrial and civil construction. – 2014. – Vol. 6. – pp. 58–61.

6. Kononenko, T.E. Methodological aspects of production diversification. Features of diversification in construction / T.E. Kononenko // Modern trends of the science and technology development. – 2015. – Vol. 4–5. – pp. 77–80.

7. Kryukov, D.O. The company's strategic development through diversification / D.O. Kryukov // Modern trends of the science and technology development. – 2014. – Vol. 3–4 (43–44). – pp. 74–81.

8. The United Company «Sibshakhtostroy» [Electronic resource] / Internet portal. – Access: http://www.oksshs.ru/ – (reference date: 12.04.2017).

9. Porokhin, A.V. Main directions of economy diversification in the region / A.V. Porokhin, T.A. Yarkova, Yu.N. Soina-Kutischeva // Basic research. – 2016. – Vol. 9–2. – pp. 399–403.

10. Soina-Kutischeva, Yu.N. Diversification of metallurgical companies: main trends and efficiency evaluation: dis. … Candidate of Economic Sciences: 08.00.05 / Yuliya Nikolayevna Soina-Kutischeva. – Kemerovo, 2006. – 185 p.

V.B. Tuyakova,
Postgraduate Student, University of Technology in Moscow Region

ACCOUNTING OF RESEARCH, DEVELOPMENT AND TECHNOLOGICAL WORKS

The article is devoted to the problems of the information generalization concerning research, development and technological works in the accounting of the innovation activity.

The aim of the article is the analysis of modern approaches to the generalization of accounting information concerning enterprises costs in the process of research, development and technological works; the substantiation of the author's position about the structuring of expenditures and the achieved research results on the development and technological works in accounting, the information of which is necessary to make managerial on-time decisions in the innovative activity.

In the article the researches of modern scientists in the accounting sphere, the thematic publications in periodicals, the fundamental standard and legal documents, regulating the innovative activity and the order of reflection of expenses and results on RTD in accounting, were used. Methods of the analysis and synthesis, induction and deduction, observation, grouping and comparison were also used.

The content of different types of expenditures incurred by economic entities in the process of research, development and technological works for the innovative development was revealed with the complex approach. Various approaches to synthesis of information on this group of expenses in accounting recommended by modern standard and legal documents and domestic scientists are stated. The author's approach to the reflection of the costs and results of these works in accounting is presented, it consists in using the new sub-accounts in the account 08-8 «Performing research, development and technological works».

The results of this research have the theoretical and application importance and can be used in the process of accounting and innovation management, as well as for further researches in the economics and management.

Systematization of the theoretical and practical approaches to this problem has shown that procedure of generalizing the information of costs and results of the innovative activity is insufficiently investigated. Therefore, the results of the analysis of the expenses content on research, development and technological works are presented in the article. It is concluded that the most complete characterization of research, development and technological works costs is possible on the basis of using five subaccounts of the second order and six subaccounts of the third order in the account 08-8. It will make it possible to implement in the accounting practice the performance of function of the calculation account by the synthetic account 08 «Investments in non-current assets» not only in relation to long-term investments in general, but also to innovative activity in particular.

Keywords: accounting, research works, development works, technological works, experimental developments, innovations, investments, incomes, expenses, expenditures.

References

1. Abubakirova, K.N. Objects of cost accounting for innovation activity / K.N. Abubakirova, E.A. Mizikovsky // Bulletin of Professional Accountants. – 2012. – Vol. 5. – pp. 39–44.

2. Bazarova, A.S. Write-off of expenses for research and development activities [Electronic resource] / A.S. Bazarova. – Access: http://www.referent.ru/48/216287- – (reference date: 18.04.2017).

3. Gracheva, M.E. Peculiarities of analysis and expenditures reporting on research and development / M.E. Gracheva // International Accounting. – 2010. – Vol. 15 (147). – pp. 39–46.

4. Zakharin, V.R. Peculiarities of accounting of research and development activities / V.R. Zakharin // Official materials for the accountant. Comments and consultations. – 2011. – Vol. 5. – pp. 32–39.

5. Mashentseva, G.A. Improvement of methodological support of research and development expenses accounting: abstract of dis. … Candidate of Economic Sciences: 08.00.12. – Kamyshin, 2013. – 20 p.

6. Mishin, M.V. Research and development activities: problems and solutions [Electronic resource] / M.V. Mishin // Profits tax: income and expenditure accounting. – 2009. – Vol. 1. – Access: https://www.lawmix.ru/bux/95151- – (reference date: 18.04.2017).

7. Nikiforova, N.V. Social security contributions and research and development activities / N.V. Nikiforova // Actual issues of accounting and taxation. – 2012. – Vol. 11. – pp. 28–37.

8. Rzhanitsyna, V. Intangible assets in the system of IFRS [Electronic resource] / V. Rzhanitsyna // Consultant. – 2005. – Vol. 21. – Access: https://www.lawmix.ru/bux/95151 – (reference date: 18.04.2017).

9. Rzhanitsyna, V. Creation of intangible assets: interpretation of IFRS [Electronic resource] / V. Rzhanitsyna // Consultant. – 2006. – Vol. 3. – Access: https://www.lawmix.ru/bux/91386- – (reference date: 18.04.2017).

10. Sapozhnikova, N.G. Information about innovations and modernization of production in corporate reporting / N.G. Sapozhnikova // Accounting. Analysis. Audit. – 2014. – Vol. 1. – pp. 32–39.

11. Sokolov, Ya.V. Accounts of accounting: content and application / Ya.V. Sokolov, V.V. Pyatov, N.N. Karzaeva // Finances and statistics. – Moscow, 2006. – 576 p.

L.R. Faizova,
Candidate of Economic Sciences, Associate Professor at the Department of statistics and econometrics, Orenburg State University

S.N. Morozova,
Candidate of Economic Sciences, Senior Lecturer at the Department of statistics and econometrics, Orenburg State University

ECONOMETRIC MODELLING OF FACTORS INFLUENCE ON THE INVESTMENT VOLUME IN THE SUBJECTS OF THE RUSSIAN FEDERATION

The purpose of this article is studying of the influence of the socio-economic factors on the volume of investment in terms of the subjects of the Russian Federation. For achievement of the goal the general scientific (the analysis and synthesis), statistical (graphic, tabular, coefficient) and econometric (correlation and regression) methods were used. The main results we have achieved: the variation of investments values per capita in total of subjects of the Russian Federation is studied and the leading (lagging) objects are established; the factors, exerting the main impact on the productive indicator, are revealed, these factors include the average salary in the region and a share of mining industry; the statistically significant econometric model is constructed and the forecasting of level of investments at the set parameters of repressors is carried

out. The results of the conducted research will be useful to researchers of macroeconomic processes, experts and officials of authorities.

Keywords: investments, econometric modelling, factors, efficiency assessment, region.

References

1. Davletshin, E.A. Comparative analysis of factors of direct foreign investments inflow / E.A. Davletshin, S.N. Kotenkova // Economy and business. – 2015. – Vol. 3 (56). – pp. 411–413.

2. Deruzhinsky, V.E. Methods of the statistical analysis of the investments efficiency into fixed capital of Russia during 2001-2012 / V.E. Deruzhinsky and others // Bulletin of the State Sea University of the Admiral F. F. Ushakov. – 2015. – Vol. 2 (11). – pp. 53–61.

3. Ivleva, N.V. Forecasting of investments into economy of Russia on the basis of the statistical analysis method and indicators application / N.V. Ivleva, O.O. Komarevtseva // Finance and the credit. – 2014. – Vol. 36 (612). – pp. 29–36.

4. Kamilova, R.Sh. Indicators system of the analysis and assessment of investments efficiency / R.Sh. Kamilova, K.M.K. Murtilova // Scientific review. Series 1: Economy and Law. – 2015. – Vol. 6. – pp. 80–84.

5. Mamayeva, I.L. System of information indicators in the analysis of long-term investments / I.L. Mamayeva // Proceedings of the Tula State University. Economic and Law. – 2014. – Vol. 2–1. – pp. 117–124.

6. Razvadovskaya, Yu.V. Regression analysis of investments and parameters of innovative development of economy in Russia / Yu.V. Razvadovskaya and others // Economy, management and investments. – 2014. – Vol. 4 (6). – p. 8.

7. Reshetova, Ya.M. Factors of attraction of direct foreign investments to the Russian regions: results of econometric modelling / Ya.M. Reshetova, D.E. Shilkov, I.S. Shorokhova // Economic theory. – 2015. – Vol. 1. – pp. 173–176.

8. Tregub, I.V. Assessment of efficiency of social investments with application of the correlation and regression analysis / I.V. Tregub // Administrative sciences. – 2014. – Vol. 4. – pp. 62–66.

9. Fedorova, E.A. Regional policy of attraction of foreign investments into the enterprise: empirical analysis / E.A. Fedorova and others // Regional economy: theory and practice. – 2015. – Vol. 4 (379). – pp. 2–12.

10. Fokina, O.M. Analysis of dynamics, structure and sources of investments in the region / O.M. Fokina // Bulletin of the Voronezh State University. Series: Economy and management. – 2015. – Vol. 2. – pp. 43–51.

Sh.M. Abbasov,
Postgraduate Student at the Department of Philosophy, Siberian Federal University

SUBJECTIVE IDEALISM AS PHENOMENON OF EUROPEAN PHILOSOPHY

The rapid development of empiricism in the European philosophy of the XVII- XVIII centuries ultimately led to its logical denial and the emergence of the subjective idealism concept of George Berkeley. The subjective idealism has gained fame of one of the most vivid and ambiguous philosophical concepts, and there is interest to it in our days. The aim of the work is to consider the subjective idealism as one of the key concepts in the history of the European philosophy, which influenced all subsequent philosophical thoughts. The methods of research were historical when analyzing the dynamics of the development of the phenomenon under investigation and analytical when considering the basic provisions of subjective idealism. The urgency of the work is determined by the fact that it highlights the problem of interpreting and understanding the subjective idealism, which has a way out to the problem of consciousness, subjectivity, in particular, to the problem of understanding. In the author's opinion, the subjective idealism has had significant impact on many philosophical concepts. «Subject» is one of the major achievements of this philosophical direction. The main provisions and conclusions of the article can be used in the history of philosophy, the philosophy of consciousness, and also in the social philosophy.

Keywords: subjectivity, objectivity, subject, consciousness, personality, understanding.

References

1. Abbasov, Sh.M. The subjective idealism and new information reality / Sh.M. Abbasov // Actual problems of social sciences: sociology, political science, philosophy, history. – 2016. – Vol. 58. – pp. 69–73.

2. Avtonomova, N.C. Sense. Mind. Rationality: monograph / N.C. Avtonomova. – Moscow: Science, 1988. – 157 p.

3. Berkeley, G. Works / G. Berkeley. – Moscow: Thought, 2000. – 560 p.

4. Bystritsky, E.K. Understanding and practical consciousness; Understanding is the window to a new world? / E.K. Bystritsky // Riddles of human understanding: collection of articles / Issuer V.P. Filatov. – Moscow: Politizdat, 1991. – pp. 221–234.

5. Gadamer, H.G. Truth and method: Foundations of philosophical hermeneutics / H.G. Gadamer. – Moscow: Progress, 1988. – 704 p.

6. Hegel, G.W.F. Encyclopedia of philosophical sciences. Volume 3. The philosophy of the spirit / G.V.F. Hegel. – Moscow: Thought, 1977. – 471 p.

7. Kudashov, V.I. Criticism of the dualism of the brain and consciousness in neuroscience and medicine / V.I. Kudashov // Siberian Medical Review. – 2012. – Vol. 2. – pp. 96–99.

8. Merleau-Ponty, M. Phenomenology of perception / M. Merleau-Ponty. – St. Petersburg: Yuventa, 1999. – 605 p.

9. Nuzhdin, G.A. Knowledge and understanding as a mean and activity [Electronic resource] / G.A. Nuzhdin. – Access: http://www.philosophy.ru – (reference date: 25.11.2013).

10. Ricoeur, P. Conflict of interpretations, essays in hermeneutics / P. Ricoeur. – Moscow: Medium, 1995. – 415 p.

11. Heidegger, M. Being and time / M. Heidegger. – Moscow: Ad Marginem, 1997. – 503 p.

12. Jakus, P.M. Problem analysis of science and philosophy: dis. ... Doctor of Philosophical Sciences: 09.00.01 / Hakuz Pshimaf Muratovich. – Yekaterinburg, 1999. – 276 p.

13. Schleiermacher, F. Hermeneutics / F. Schleiermacher. – St. Petersburg: European house, 2004. – 242 p.

14. Shpet, G.G. Phenomenon and sense. Phenomenology as the fundamental science and its problems / G.G. Shpet. – Moscow: Germes, 1914. – 169 p.

T.Z. Aralbaev,
Doctor of Technical Sciences, Head of Department, Professor at the Department of computer science and information security, Orenburg State University

T.V. Abramova,
Assistant at the Department of computer science and information security, Orenburg State University

S.Y. Romanenko,
Undergraduate student at the Department of computer science and information security, Orenburg State University

COMPUTER MONITORING CONCEPT OF INNOVATION ACTIVITY OF YOUNG PROFESSIONALS AND STUDENTS BASED ON THE ANALYSIS OF INFORMATION RESOURCES IN THE GLOBAL INTERNET

The aim of this article is to increase the activity of young people in the innovative activity of the nation. The associative-majority and semantic approaches to the search for data on innovation activity and the method of multi-criteria evaluation of the significance of the innovation result were used in the work. The presented concept gives a generalized characteristic of innovative activity of higher educational institutions taking into account their innovative potential, type, volume and significance of innovative results. Scientific novelty: due to the automation of the process of data collection, registration and processing, the efficiency, completeness and quality of the analysis are increased, which in its turn should help to increase the efficiency of selecting a strategy for managing the innovative activity of young specialists and students. Practical significance: the presented concept is intended for implementation on the network information portal of the organization monitoring IA in the form of a subsystem. The results can be used within the innovative management in the analysis of innovation activities as of separate HEIs and their employees, so of the region as a whole.

Keywords: *innovative activity monitoring, automated information system, analysis of the results of research activities, analysis of data on the Internet.*

References

1. Aralbaev, T.Z. Combinatorial semantic model for the generation of hypotheses / T.Z. Aralbaev, T.V. Abramova, R.R. Galimov // Information and Security: scientific journal. – 2016. – Vol. 19. – Vol. 3. – pp. 379–384.

2. Galimov, A.M. About the evaluation of the results of the university innovative activity / A.M. Galimov, A.R Zakirova, A.V. Makhanko // Educational Technologies and Society. – 2013. – Vol. 16. – Vol. 4. – pp. 403–411.

3. Elenev, D.V. Automation of the national research university management system and monitoring of its activities / D.V. Elenev, V.S. Kuzmichev, D.E. Pashkov // Software products and systems. – 2012. – Vol. 3. – pp. 31–34.

4. Kalinina, V.V. Creation of information-analytical system of monitoring and evaluation of the region innovative development / V.V. Kalinina // Bulletin of the Volgograd State University. Series 3: Economy. Ecology. – 2012. – Vol. 2. – pp. 38–45.

5. Klementeva, O.V. Implementation of the automated monitoring of the innovative activity of subjects with the help of modern information technologies / O.V. Klementeva, O.V. Kolosova // Bulletin of the Tambov State Technical University. – 2009. – Vol. 15. – Vol. 3. – pp. 484–488.

6. Kowalskaya, N.M. The simulation model of decision support system in the tasks of the adversarial nature on the basis of the analytic hierarchy process / N.M. Kowalskaya, A.A. Rychkova // Registered in the University Electronic Resources Fund of the OSU, 23.05.2016. Registration number 1271. – Orenburg: the OSU, 2016. – 4 MB.

7. Kowalskaya, N.M. The analytic hierarchy process in the distributed decision support systems on the adversarial nature points / N.M. Kowalskaya, A.A. Rychkova // Science and modernity. – Ufa: MTsII OMEGA Science, 2016. – Vol. 3. – pp. 68–73.

8. Novikova, T.G. Examination of innovative activity / T.G. Novikova // Municipal education: innovation and experiment. – 2008. – Vol. 1. – pp. 62–65.

9. Problems of informative culture [Electronic resource] // Information and communication technologies in education. – Access: http://www.ict.edu.ru/vconf/index.php?a=vconf&c=g – (reference date: 20.10.2016).

10. Saaty, T.L. Making decisions. Analytic hierarchy process / T.L. Saaty. – Moscow: Radio and Communications, 1989. – 360 p.

I.G. Kirin,

Doctor of Engineering Sciences, Professor at the Department of general physics, Orenburg State University

THE FIBER AND OPTICAL LINE OF INFORMATION TRANSFER WITH LASER SYSTEM OF RADIATION PROTECTION

The optical fibers have the unique characteristics of the medium to transmit information, but they are sensitive to the effects of physical fields, which, on the one hand, allow creating the fiber-optic sensors with unique characteristics, on the other hand, it is the reason for reducing the noise immunity of the transmission systems. The aim of this article is to develop the noise-immune fiber optic information transmission line allowing to work in the conditions of exposure to radiation, and other destabilizing factors, leading to higher attenuation of fiber lines. The scheme for the construction of fiber and optical line, allowing transferring data when being subjected to destabilizing factors and radiation, is proposed. In the proposed scheme, the desired signal is defined in the Registrar line from the transmitted on it light flux with wavelength λ1. Then it is corrected according to the value of attenuation of fiber-optic channel, which is determined by the signal from the emitting source at the wavelength λ2 of diagnostic system of the line, specially introduced in its structure. Protection of fiber channel from ionising radiation is carried out by annealing of stable and unstable absorption bands induced by this radiation. The signal from the source of optical radiation of diagnostic system at the wavelength λ2 is compared with another signal of the reference voltage source, and if the difference signal is below a certain level, the capacity of this source is increased until they will be equal. After the restitution of the transmission of fiber-optic channel to the original level, the power of the radiation source of the line diagnostic system is automatically reduced to the original level. It is shown, that it is possible to completely reduce the influence of destabilizing factors on the resulting error, by using the digital methods of performance of all operations in the electronic part of the line.

Keywords: *fiber and optical lines, radiation, attenuation diagnostics, radiation protection by means of laser radiation, correction of the output signal regarding the attenuation, the automatic choice of the level of the protecting laser radiation.*

References

1. Busurin, V.I., Nosov, Yu.R. Fiber optical sensors: physical bases, calculation and application / V.I. Busurin, Yu.R. Nosov. – Moscow: Energoatomizdat, 1990. – 156 p.

2. Gavrichev, V.D., Dmitriev, A.L. Fiber optical sensors of the magnetic field: tutorial / V.D. Gavrichev, A.L. Dmitriev. – St. Petersburg: SPb NRU ITMO, 2013. – 83 p.

3. Gorelik, O.A., Kirin, I.G. Numerical simulation of the fiber light guide thermal heating by the laser radiation / O.A. Gorelik, I.G. Kirin // Modern technologies in power industry, electronics and computer science: Materials of Regional scientific and practical conference. – Orenburg: OSU, 1999. – pp. 85–87

4. Jackson, R.G. The latest sensors / R.G. Jackson. – Moscow: Technosphere, 2007. – 384 p.

5. Dianov, E.M., Koryshenko, L.S., Nikitin, E.L., Rybaltovskii, A.O., Chernov, P.V. Reversible bleaching of induced absorption in fiber light guides / E.M. Dianov, L.S. Koryshenko, E.L. Nikitin, A.O. Rybaltovskii, P.V. Chernov // Quantum electronics. – 1979. – Vol. 6. – Vol. 5. – pp. 1082–1083.

6. Dianov, E.M., Koryshenko, L.S., Nikitin, E.L. Reversible bleaching of induced absorption in fiber light guides / E.M. Dianov, L.S. Koryshenko, E.L. Nikitin, A.O. Rybaltovskii, B.G. Skuyban, V.V. Sulimov, P.V. Chernov // Quantum electronics. – 1989. – Vol. 9 – Vol. 4. – pp. 801–810.

7. Dianov, E.M., Koryshenko, L.S., Nikitin, E.L. Influence of the temperature and optical power level on the induced absorption in fiber light guides of pure quartz glass / E.M. Dianov, L.S. Koryshenko, E.L. Nikitin // Quantum electronics. – 1981. – Vol. 8. – Vol. 9. – pp. 1935–1944.

8. Dianov, E.M., Rybaltovskii, A.O., Nikitin, E.L. Radiation and optical properties of the fiber optical light guides on the basis of pure quartz glass (review) / E.M. Dianov, A.O. Rybaltovskii, E.L. Nikitin, L.S. Koryshenko, V.V. Sulimov, P.V. Chernov // Quantum electronics. – 1983. – Vol. 10. – Vol. 3. – pp. 458–464.

9. Kirin, I.G. Special radiation resistant optical fiber and optoelectronic sensors and systems / I.G. Kirin. – Moscow: University 79.

10. Kirin, I.G. Special radiation resistant optical fiber channels (part 1) / I.G. Kirin // Intelligence. Innovation. Investment. – 2014. – Vol. 1. – pp. 144–150.

11. Kirin, I.G. Noise-immune fiber optical line of information transmission with laser diagnostics and security system / I.G. Kirin // Intelligence. Innovation. Investment. – 2016. – Vol. 1. – pp. 81–83.

12. Kirin, I.G. Irreversible photodecolouration of fiber light guides by means of laser radiation / I.G. Kirin // Analysis of the structures of electronic and computer engineering. – Orenburg: Orenburg State University, 1995. – pp. 111–123

13. Novitsky, P.V. Dynamics of the errors of measuring instruments / P.V. Novitsky. – Leningrad: Energoatomizdat, 1990. – 191 p.

14. Okosi, T. Fiber optical sensors / T. Okosi. – Leningrad: Energoatomizdat, 1990. – 256 p.

15. Sklyarov, O.K. Fiber optic networks and systems / O.K. Sklyarov. – Moscow: SOLON–Press, 2004. – 272 p.

16. Tomashuk, A.L., Goland, K.M., Zabezhailov, M.O. Development of fiber waveguides for application in elevated radiation level / A.L. Tomashuk, K.M. Goland, M.O. Zabezhailov // Fiber optical technologies, materials and devices. – 2001. – Vol. 4. – pp. 52–56.

17. Udd, E. Fiber optic sensors / E. Udd. – Moscow: Technosphere, 2008. – 520 p.

E.E. Vitvitskiy,

Doctor of Technical Sciences, Head of Department, Professor at the Department of the organization of transportation and transport management, Siberian Automobile and Highway University

V.I. Rassokha,

Doctor of Technical Sciences, Associate Professor, Dean at the Transport Faculty, Orenburg State University

E.S. Fedoseenkova,

Postgraduate Student at the Department of the organization of transportation and transport management, Siberian Automobile and Highway University

THE INFLUENCE OF DISTANCE ON FUNCTIONING INDICATORS OF THE SET OF MICROSYSTEMS OF GOODS TRANSPORTATION BY PUBLIC MOTOR TRANSPORT

With the reform of the domestic economy there is a need for testing the compliance of modern practice with the number of views and dependencies of the classical theory of goods transportation. From this point of view, the question of the influence of the distance of goods transportation on the development of motor vehicles with respect to public road transport is considered. Calculated by two techniques, the dependences of development in tons and ton-kilometers as for separate vehicles so for set of microsystems of goods transportation in the city are established. These sets are organized as several pendulum routes with the contrary not loaded mileage, on each of which one vehicle works in isolation and the waiting time of loading and unloading operations is zero. Analysis of the results allowed drawing a conclusion about inexpediency of use, because of significant errors, the corresponding formulas of the classical theory performance of freight automobile transportation.

Keywords: *a set of microsystems of goods transportation, distance, development.*

References

1. Afanasyev, L.L. Integrated transport system and automobile transportation / L.L. Afanasyev, N.B. Ostrovsky, S.M. Zuckerberg. – Moscow: Transport, 1984. – 333 p.

2. Vitvitskiy, E.E. Medium transport system of cargoes transportation in cities [Electronic resource] / E.E. Vitvitsky, E.S. Fedosenkova // Development of the theory and practice of automobile transportation, transport logistics: Materials of the International scientific and practical conference «Architectural-construction and road-transport complexes: problems, prospects, innovations», edited by E.E. Vitvitskiy. – Omsk: SibADI, 2016. – pp. 191–194.

3. Vorkut, A.I. Development of theoretical bases and methods for rational organization of transportation process in automobile transportation of batch cargo: dis. … Doctor of Technical Sciences. – Kiev, 1986. – 442 p.

4. Mirgorodsky, M.A. Improving the efficiency of automobile transportation of goods by small shipments: dis. … Candidate of Technical Sciences: 05.22.10. – Oryol, 2010. – 152 p.

5. Nikolin, V.I. Cargo automobile transportation: monograph / V.I. Nikolin, E.E. Vitvitsky, S.M. Mochalin. – Omsk: Publishing house «Variant-Siberia», 2004. – 480 p.

6. Nikolin, V.I. Scientific bases of perfection of the cargo automobile transportation theory: dis. … Doctor of Technical Sciences: 05.22.10. – Moscow, 2000. – 343 p.

7. Odintsov, D.G. Transport service of construction flows: monograph / D.G. Odintsov, V.A. Nevyantsev. – Moscow: Stroyizdat, 1992. – 337 p.

8. Rassokha, V.I. Situational management of motor transportation systems. Part 1. System efficiency of motor transport operation / V.I. Rassokha // Bulletin of the Orenburg State University. – 2009. – Vol. 9. – pp. 148–153.

9. Rassokha, V.I. Increase in efficiency of motor transport operation on the basis of the developed scientific and technical, technology and administrative solutions: dis. … Doctor of Technical Sciences: 05.22.10. – Orenburg, 2010. – 400 p.

10. Fedoseenkova, E.S. Report on State budgetary research work «Designing of goods transportation in secondary transport systems» (intermediate) / SibADI; Research supervisor Vitvitskiy E.E.; the executive Fedoseenkova E.S. – Reg. 215021040033. – 2013. – 358 p.

11. Shapoval, D.V. Improving the operational planning of transportations for small-size freight by cars on radial routes in the cities: dis. … Candidate of Technical Sciences: 05.22.10. – Omsk, 2012. – 138 p.

S.P. Ozornin,
Doctor of Technical Sciences, Professor at the Department of Construction and Road Machines, Transbaikal State University

I.A. Tarasov,
Post-graduate Student at the Department of Construction and Road Machines, Transbaikal State University

I.E. Berdnikov,
Post-graduate Student at the Department of Construction and Road Machines, Transbaikal State University

SAFETY AND EFFICIENCY OF OPERATION OF TRANSPORT TECHNOLOGICAL MACHINES APPLYING METHODS CONTROLLING CHANGES OF THEIR TECHNICAL CONDITION

In the article the technique, increasing safety and efficiency of transport technological machines operation in the northern regions of the Russian Federation, is given. The objective function of the optimization of the operating process of the transport-technological machines under the extreme climatic conditions is described. Recommendations regarding the application of diagnostic methods, controlling changes in the technical state for the purpose of prognostication of the machines failures, are proposed. It is shown that increase in safety and efficiency of machines operation, and also the reduction of expenditures for engineering service and repair, directly depend on timeliness and quality of the control of changes in their technical state. Under the northern conditions the urgency of these measures rises and is caused by the negative effect of low temperatures not only on units and aggregates of machines, but also on human health. The risk of the appearance of the road-transport incidents or accident is minimized with the aid of the three-stage system of the control of changes in the technical state of machines. The economic feasibility of this system is explained by the possibility of updating the strategy of technical service, forecasting and revealing failures before their emergency. The described system of engineering control forms the prerequisites for the creation the regulations of the replacements of components, limiting the reliability both of the domestic and of the foreign machines, and also introducing the information and technical support to the machines operation.

Keywords: *transport-technological machines, safety, engineering control, the probability of failure, prognostication, the remote monitoring.*

References

1. Bazhenov, Yu.V. Forecasting the residual resource of structural elements under operating conditions / Yu.V. Bazhenov, M.Yu. Bazhenov // Fundamental researches. – 2015. – Vol. 4. – pp. 16–21.

2. Bulgakov, N.F. Quality management of ATS prevention. Modelling and optimization / N.F. Bulgakov, Ts.Ts. Burkhiev. – Krasnoyarsk: KSTU, 2002. – 164 p.

3. Guericke, B.L. Monitoring and diagnostics of the technical condition of machine aggregates: Monitoring of technical condition by the parameters of vibration processes / B.L. Guericke. – Kemerovo: KuzSTU, 1999. – 189 p.

4. Golovin, S.F. Operation and maintenance of road vehicles, cars and tractors / S.F. Golovin, edited by E.S. Lokshin. – Moscow: Mastery, 2002. – 464 p.

5. Kramarenko, G.V. Technical operation of cars / G.V. Kramarenko. – Moscow: Transport, 1972. – 398 p.

6. Lukinsky, V.S. Prediction of reliability indicators of transmissions units / V.S. Lukinsky, E.I. Zaitsev // Reliability and durability of machines and structures. – Vol. 5. – Kiev: Naukova Dumka, 1984. – 325 p.

7. Maltsev, A.I. Applied mechanics. Section: Monitoring the technical state of large machines / A.I. Maltsev, A.A. Maltsev. – Elektrostal: DAMO, 1998. – 62 p.

8. Ozornin, S.P. Organization and technology of the firm service of transport and technological machines: monograph: in 2 parts. Part 1 / S.P. Ozornin. – Chita: Transbaikal State University, 2013. – 210 p.

9. Ozornin, S.P. Organization and technology of the firm service of transport and technological machines: monograph: in 2 parts. Part 2 / S.P. Ozornin. – Chita: Transbaikal State University, 2013. – 131 p.

10. Operation of road machines / A.M. Sheinin, A.P. Krivshin, B.I. Filippov and others. – Moscow: Mechanical Engineering, 1980. – 336 p.

11. Ltd «AvtoMash» [Electronic resource] – Access: http://www.avtomash.ru/ – (reference date: 02.05.2017).

12. Yakunin, N.N. Methodological basis for control and management of technical condition of cars in operation: monograph / N.N. Yakunin. – Moscow: Mechanical Engineering, 2003. – 178 p.

N.S. Pogotovkina,
Associate Professor at the Department of transport machinery and transport technological processes, Far Eastern Federal University

P.P. Volodkin,
Doctor of Technical Sciences, Head of Department, Professor at the Department of transport maintenance, Pacific National University

THE CHOICE OF HAULAGE CONTRACTOR FOR SCHOOL CHILDREN TRANSPORTATION USING PUBLIC PROCUREMENT

The urgency of the problem under study is caused by the fact that over the period of several years the accidental rate with the participation of school buses has been remaining at a high level in our country. The work is aimed at identifying the new ways of arranging the transportation of pupils in order to improve the safety of this transportation. The main approach to the study of this problem is the analysis of domestic and foreign systems of schoolchildren transportation, which revealed that the high level of transportation safety is provided if transportation is carried out by specialized road transportation contractors. The study presents the results of the analysis of accidental rate with the participation of school buses for the last five years, proposes the algorithm for choosing a road transportation contractors for schoolchildren transportation within the competitive selection, and also defines the significance of values of cost and non-cost criteria of the tender documentation. The materials of the article can be useful in selecting organizations for student transportation in the regions of Russian Federation.

Keywords: *schoolchildren transportation, transportation safety, public procurement, competitive selection*

References

1. Road accidents with buses, transporting children, in the RF in 2012-2015 years [Electronic resource] / Official website: RIANews. – Access: http://ria.ru/spravka/20150521/1065679419.html – (reference date: 27.09.2016).

2. Anokhin, S.A. Development of «the rural school bus» issue / S.A. Anokhin // Questions of modern science and practice. Vernadsky Federal University. – 2012. – Vol. 1. – pp. 1–15.

3. State regulation of the school transportation safety in our country and abroad / N.M. Sivolobov, S.A. Shiryaev, V.A. Gudkov, A.A. Rayushkina // Proceedings of the Volgograd State Technical University. – 2013. – Vol. 10 (113). – Vol. 6. – pp. 82–85.

4. Road accidents with buses, transporting children, in Russia in 2011-2012 [Electronic resource] / Official website: RIANews. – Access: https://ria.ru/Incidents/20120904/499450505.html – (reference date: 20.09.2016).

5. Pashutina, N.A. The experience of school transportation by specialized passenger transport in the Russian Federation / N.A. Pashutina // Humanitarian, socio-economic and social sciences. – 2014. – Vol. 6–2. – pp. 243–250.

6. Pogotovkina, N.S. Application of the principles of the concept of children transportation organization by buses to schoolchildren transportation / N.S. Pogotovkina, P.P. Volodkin // Traffic organization and traffic safety: Materials X International scientific and practical conference 16 March 2017, Tyumen / The Ministry of Education and Science RF, Federal State Budgetary Educational Institution of Higher Education «Tyumen Industrial University». – Tyumen, 2017. – pp. 188–190.

7. Pogotovkina, N.S Development of the algorithm of the tender holding for the schoolchildren transportation / N.S. Pogotovkina, P.P. Volodkin // Competitiveness in the global world: economics, science, technology. – 2016. – Vol. 1. – pp. 134–137.

8. Problems and directions for development of schoolchildren transportation in rural areas / N.M. Sivolobov, S.A. Shiryaev, V.A. Gudkov, A.A. Rayushkina // Scientific papers SWorld. – 2012. – Vol. 4. – Vol. 1. – pp. 99–103.

9. Information about the road safety indicators [Electronic resource] / Road Traffic Police. – Access: http://www.gibdd.ru/stat/ – (reference date: 06.10.2016).

10. Shiryaev, S.A Organizational and technological problems of schoolchildren transportation / S.A. Shiryaev, A.A. Rayushkina, N.M. Sivolobov // The automotive industry. – 2014. – Vol. 5. – pp. 22–25.

M.V. Mousokhranov,
Candidate of Technical Sciences, Associate Professor at the Department of Machine Building Technologies, Kaluga Branch of the Bauman Moscow State Technical University (National Research University)

V.V. Kalmykov,
Senior Lecturer at the Department of Machine Building Technologies, Kaluga Branch of the Bauman Moscow State Technical University (National Research University)

J.A. Savina,
Undergraduate Student at the Department of Machine Building Technologies, Kaluga Branch of the Bauman Moscow State Technical University (National Research University)

MATHEMATICAL MODELING OF QUALITATIVE CHARACTERISTICS AT PROCESSING OF STRUCTURAL MATERIAL BASED ON IRON

The aim of this article is to establish a correlation between the micro geometry of the machined surfaces of parts made of structural material and the level of surface energy. Methods were applied: the estimation was made using the Spearman rank correlation coefficient. The mathematical models were compared in the form of regression equations, obtained by methods of experiment planning using factor analysis, where the factors were established at two levels. The degree of influence of the hardness, geometry of the cutting tool and lubrication parameters on the surface energy of the treated surfaces was determined, and also the nature of this influence was determined. The mathematical model of the roughness of steel 45 was obtained in a similar way. The effect of the hardness, geometry of the cutting tool and lubrication parameters on the roughness of the treated surfaces was determined and the nature of this influence was determined. The correlation relationship between the roughness and surface energy of the surfaces of steel 45 treated with different cutting regimes has been found. Using the Spearman's rank correlation coefficient, the absence of convincing relationship between the surface roughness and surface energy is shown. Practical significance: the main provisions and conclusions of the article can be used in the scientific and industrial activities when considering issues related to the operational properties of the surfaces of machine parts, obtained by machining of structural materials.

Keywords: Surface energy, roughness, mathematical models.

References
1. Adler, Y.P., Granovsky, Yu.V., Markova, E.V. Planning the experiment when searching for optimal conditions / Y.P. Adler, Yu.V. Granovsky, E.V. Markova. – Moscow: Science, 1976. – 280 p.

2. Zenkina, I.A. The main moment of the resistance forces in a gas-dynamic bearing with spiral grooves / I.A. Zenkina // Don Engineering Bulletin. – 2014. – Vol. 30. – Vol. 3. – p. 88.

3. Zenkina, I.A. Mathematical modeling of gas-dynamic bearings with spiral grooves: abstract of dis. … Candidate of Physical and Mathematical Sciences: 05.13.18 / Zenkina I.A. – Tula, 2004. – 24 p.

4. Kalmykov, V.V., Fedorova, O.S. The basic statistical methods for analyzing the results of experiments / V.V. Kalmykov, O.S. Fedorova // Electronic Journal: Science, Technology and Education. – 2016. – Vol. 1 (5). – pp. 68–75.

5. Musokhranov, M.V., Kalmykov, V.V., Sorokin, S.P. Energy indicators of the quality of machine parts and methods for their measuring [Electronic resource] / M.V. Musokhranov, V.V. Kalmykov, S.P. Sorokin // Fundamental research. – 2015. – Vol. 10–1. – pp. 43–49. – Access: http://fundamental-research.ru/en/article/view?id=39121 – (reference date: 01.03.2017).

6. Musokhranov, M.V., Kalmykov, V.V., Logutenkova, E.V., Sorokin, S.P. Energy state of the surface layer of machine parts / M.V. Musokhranov, V.V. Kalmykov, E.V. Logutenkova, S.P. Sorokin // Modern science-intensive technologies. – 2016. – Vol. 5–2. – pp. 276–279.

7. Musokhranov, M.V., Savina, Y.A. Technique of carrying out the experiment for the analysis of factors affecting the quality of the surface [Electronic resource] / M.V. Musokhranov, Y.A. Savina // High technology in instrument engineering and engineering and the development of innovative activity in the university: Materials of the All-Russian Scientific and Technical Conference 15–17 November 2016. – Vol. 1. – Kaluga: Publishing House of the Bauman MSTU, 2016. – pp. 40–42. – Access: http://conference.bmstu-kaluga.ru/uploads/userfiles/december_2016_1.pdf – (reference date: 01.03.2017).

8. Novik, F.S., Arsov, Y.B. Optimization of metal technology processes by experiment planning methods / F.S. Novik, Y.B. Arsov. – Moscow: Mechanical engineering; – Sofia: Technique, 1980. – 304 p.

9. Filippova, I.A., Khaychenko, V.E., Gerasimova, N.S. Increase in the mechanical properties of steel 45L by means of modifying methods / I.A. Filippova, V.E. Khaychenko, N.S. Gerasimova // Foundry of Russia. – 2016. – Vol. 3. – pp. 16–20.

10. Gary Stygera, Rudolph F. Laubscher, Gert A Oosthuizen Effect of constitutive modeling during finite element analysis of machining-induced residual stresses in Ti6Al4V Procedia CIRP / Gary Stygera, Rudolph F. Laubscher, Gert A Oosthuizen. – Vol. 13. – 2014. – pp. 294–301.

11. Madyira, D., Laubscher, R.F., N. Janse van Rensburg and Henning, P.F. High speed machining induced residual stresses in Grade 5 titanium alloy / D. Madyira, R.F. Laubscher, N. Janse van Rensburg, P.F. Henning // Proceedings of the Institution of Mechanical Engineers, Part L // Journal of Materials Design and Applications. – 2014. – Vol. 227. – Vol. 3. – pp. 208–215.

12. Persson, B.N.J. Sliding Friction Physical Principles and Applications / B.N.J. Persson // 2nd Edition Springer–Verlag. – Berlin Heidelberg GmbH, 2000. – 462 p.