

Competency

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5 Legislative Regulation of Innovation Activity. Dr. S.G. Avrutskaya, Associate Professor, Management and Marketing Department, D.I. Mendeleev University of Chemical Technology of Russia, Moscow, Prof. Dr. G.V. Pankina, Rector, Federal State Autonomous Educational Institution on Further Professional Education, Academy for Standardization, Metrology and Certification (Educational) (FSAEI FPE ASMS), Moscow

Transition from the resources and export-driven model of economic development to the innovation-driven model proclaimed by the President and the Government of Russia requires an appropriate legislative basis. The law 'On Science and the State Scientific and Technical Policy' is at the heart of the legislation on the innovative activity (IA). It is supported by a number of laws regulating specific aspects of IA — functioning of subjects of IA, establishing innovative infrastructure, protection of intellectual property rights, development of human resources, transfer and commercialization of technologies, and technical requirements to innovative products and processes.

The state support to IA can be provided as at the federal level, so by subjects of the federation. Direct methods of the state stimulation of IA mean distribution of budgetary funds both on a special-purpose and on a competitive basis. In addition, the state can support IA and subjects of IA indirectly, founding elements of innovative infrastructure or providing tax and (or) customs privileges

Key words: state stimulation of innovation, innovation policy, innovative activity of regions, human resources, innovative technology, innovation infrastructure, institutes for development

16 Assessment of Universities Activities on Commercialization of the Research and Development Results. Dr. I.L. Borisenkov, Deputy Chairman, Section of Applied Problems at the Presidium of the Russian Academy of Sciences, Moscow, Dr. V.L. Lyaskovskij, Professor N.E. Bauman MSTU, Moscow, Dr. A.I. Polubehin, Director, Innovative Technological Center of N.E. Bauman MSTU, Moscow, Dr. S.V. Stukalin, Head of Laboratory, FSBI 46 Central research Institute of Defense Ministry of Russia, Moscow

Russian higher education institutions have a great scientific, technical and personnel potential. Their activity assessment in research commercialization and technological developments of dual purpose results will establish the necessary mechanisms to support universities activities for research and technological results commercialization. It will also increase the efficiency of scientific and research works. Due to this fact the effectiveness of the budget expenditures on research and development will grow higher too. The authors assess the results of the universities commercialization activities on the example of dual purpose studies and technological developments. The identification and provision of conditions for commercialization of such technologies is one of the most important tasks in the process of national innovation system formation. Indicators and the method of assessing opportunities of higher educational institutions for research commercialization and technological developments of dual purpose results are proposed. Approbation of the offered method was conducted on the example of leading higher educational institutions that realize developments of dual purpose and are located in all Russian Federation Federal districts

Key words: research and development works, technologies commercialization, indicators of commercialization, technologies of dual purpose, higher educational institutions

24 Regional Systems Education: Innovative Quality Management. Assurance S.V. Artyukhina, Graduate Student, FSAEI FPE ASMS, Moscow

New economic conditions and objectives set in the national project Education require new managerial paradigm formation, where the role

of innovative quality management assurance becomes a strategic direction for the development of any educational system. The analysis of regional educational systems activities in the aspect of national project Education realization is held. Main problems that arise in its implementation and that are typical for the majority of Russian Federation regional educational systems are identified. Special attention is paid to system quality management in terms of its innovative assurance, as well as to the issues of efficiency evaluation of the implemented innovative educational projects. Development of the educational activity innovative quality management system assurance and its effectiveness assessment is an urgent scientific and practical problem. It is hardly possible that it will be solved without a systematic approach in regional educational structures

Key words: quality, innovative activity, regional systems education, innovative process, innovation to ensure the quality management, educational activity

28 Model Structure of the National System of Regulation of the Chemical Products Circulation. D.O. Skobelev, Director, FSUE Russian Scientific and Research Center of Standardization, Information and Certification of Raw materials, Materials and Substances (FSUE VNITSSMV), Moscow, Prof. Dr. P.A. Storozhenko, General Director, SSC RF FSUE State Scientific Research Institute of Chemistry and Technology of Organoelement compounds, Moscow, corresponding member of RAS, E.V. Zhurba, Chief, FSUE VNITSSMV, Moscow, Dr. N.M. Muratova, Head Department, FSUE VNITSSMV, Moscow

The national system of chemical products/chemical substances circulation regulation in the Russian Federation is complex, multi-component and with many interactions between its elements. It is constantly changing and evolving under the influence of external and internal factors. First of all, such factors are international regulation in this area and national priorities.

The model of the national system of chemical products/chemical substances circulation regulation in the Russian Federation is described. The objects of regulation, system participants, national priorities, state regulation indicators, information resources and other aspects are discussed in detail. Methods of informing regulation system members about hazards in the process of circulation are on consideration. One of the Russian Federation model regulation system elements is the Center for the provision of information in emergency situations the turnover of chemical products. It allows providing timely the necessary information to any interested person in case of an incident

Key words: chemical products/chemical substances, regulation objects, regulation indicators, information resources, state regulation instruments

36 Improvement of Energy Efficiency in Russia. I.B. Kuskova, Editor, FSAEI FPE ASMS, Moscow

Not so long ago the energy efficiency program was adopted in Russia. According to it by 2020 specific power consumption in the country should be reduced by 40 %. However, measures taken in this area are realized not as actively as the government prefer. Mostly all this is due to the objective factors. One of them is the relatively low cost of energy resources and energy in Russia. Another reason is the imperfection of the technical regulation, lack of clear to the public and businesses incentives to increase energy efficiency. And, finally, there are macroeconomic problems. The risk of the global and Russian economies growth slowing makes domestic business be cautious in its investment plans, also including energy efficiency. Here are some interesting speeches given during the discussion on energy efficiency, held in the framework of the St. Petersburg XVII international economic forum

Key words: energy efficiency, power intensity, energy supply, modernization, market model, energy efficiency certificate, macroeconomic problems, investment plans business, Russian economics

46 System of Evaluation of the Quality of Processes of Products Life Cycle of Flour-milling Production. Prof. Dr. G.V. Pankina, Rector, FSAEI FPE ASMS, Moscow, Ju.M. Sapego, Deputy Director, Voronezh branch of FSAEI FPE ASMC, Voronezh, Prof. Dr. A.I. Solyanik, Director, Voronezh branch of FSAEI FPE ASMC, Voronezh

Quality evaluation system of flour-milling enterprises life cycle products processes with the application of mathematical theory of fuzzy sets is proposed. It is possible to visualize a complex quality evaluation of technological process Flour production which is realized in the FuzzyTech environment using the method of fuzzy clustering with the S-average algorithm. By setting clusters borders, a person who makes decisions has an opportunity to receive the operative information about the current status of this process in order to take administrative decisions and to determine the stability of the process in the aspect of its functioning quality.

The proposed methodology of integrated quality evaluation of flour-grinding enterprises QMS product life-cycle processes can be implemented in the information system of the computer support of the decision-making process. Such system allows to estimate objectively the basic technological processes in the aspect of functioning quality, significantly reducing the time of making both operational and strategic decisions on their improvement and management

Key words: fuzzy set, linguistic variable, term set, Membership function, fuzzyfication, defuzzyfication, clustering, fuzzy logic conclusion

52 Remote Access System in Metrology and Education. Dr. F.V. Bulygin, Senior Researcher, Deputy Head, Department of Optical and Physical Measurement, FSAEI FPE ASMS, Moscow, O.E. Dracheva, Engineer, VNIIOFI, Dr. V.L. Lyakovskiy, Head of Laboratory, FSUE All-Russian Research Institute for Optical and Physical Measurements (VNIIOFI), Moscow, E.A. Ivashin, 2-nd category engineer, FSUE VNIIOFI, Moscow

In order to ensure competitive advantages it is necessary to reduce the terms of providing innovative enterprises by the required number of qualified personnel. Distance and e-learning improve the effectiveness of training. At the same time the remote access systems provide different levels of access and involvement in real measuring and production processes, they may include special hardware modules like interactive educational programs and laboratory works for acquiring step by step practical skills.

An interactive educational-scientific metrological complex is considered to be functioning in the remote access mode. It works on the basis of the unique installation for measurement of the nanoheterostructures energy saving led lighting systems photometric and color settings. The complex was included in the State register of measuring instruments. It is equipped with a set of measurement procedures and sample measures. The complex traceability is ensured to its primary state standards. An interactive software simulator with a set of methodical materials was created for education. It includes manuals and laboratory works for training students to conduct measurements on this device in the remote access mode

Key words: e-learning, remote access, energy-saving, LEDs, measurement, lighting systems, metrological complex

60 Verification Error of Digital Measuring Devices. Dr. N.N. Vostroknutov, Senior Researcher, Acting Associate Professor, Department Electrical Measurements, FSAEI FPE ASMS, Moscow

The work of metrological laboratories on verification of digital measuring devices and analog-to-digital converters increases due to the increasing spread of these devices in laboratory practice and production. The verification results reliability as process control error depends on which method of measurement used while verification. The analysis of the most common measurement techniques used for digital measuring devices verification, from the point of view of regulatory requirements ensuring implementation

to verification reliability is given in the article. It is necessary to apply only correct universal methodology error control in accordance with the metrological instructions MI 187–86, MI 188–86 — State system for ensuring the uniformity of measurements. — Reliability and requirements to the methodologies of measuring instruments. The author offers metrologists conducting the test of types, and analysis of the documentation on digital measuring devices, to make efforts for the exception of the unreliable verification methods from documentation on these measuring devices

Key words: digital measuring devices, analog-to-digital converters, verification reliability, validation methods

71 Modernization of Domestic Mechanical Engineering on the Basis of Introduction of Innovative Technologies. Dr. A.E. Artes, Professor, The Moscow State Technological University Stankin (MSTU STANKIN), Moscow

A brief analysis of the achievements made by the four mechanical engineering enterprises that lead actively machines modernization and introduction of innovative technologies that provide manufactured products quality is given. The author believes that the restoration of the missed opportunities of the domestic engineering industry during the so-called perestroika should develop through the innovative technologies introduction.

Today the problem of recovering large forgings production level and quality can be traced. It is possible to do by analyzing development results of domestic engineering industry several most successful leaders. The author analyzes the state of affairs of the four mechanical engineering enterprises, that lead actively forging equipment modernization and innovative technologies introduction.

A special place among them is occupied by Verhnesaldinskaya steel Corporation VSMPO–AVISMA, the world's only integrated producer of titanium.

An example of Russia railway transportation development problem solving is the increase in wheels production on the Vyksunskaya metallurgical plant, a part of United metallurgical company.

One of the leaders in large forgings production among domestic machine-building enterprises is Izhorsky plant Spetsstal. Among enterprises with an upgraded press-forging production it is necessary to mention JSC Tyajpressmash.

The given examples show the recovering of domestic mechanical engineering development possibilities that were lost during the time of perestroika. Restoration should develop through innovative technologies introduction

Key words: domestic mechanical engineering, modernization, large forgings, hydraulic stamping presses, forging manipulator

74 On the Tasks of Rosstandart. Prof. Dr. G.I. Elkin, Head, Federal Agency on Technical Regulation and Metrology, Moscow

The role of international standardization in Russia is an objective fact from the standpoint of international trade globalization and economic partnership strengthening, especially because of entering the WTO. In recent years Rosstandart has managed to do a lot in the field of international standardization. 647 Russian experts take part in international standards development. The number of activities under the ISO aegis conducted on the territory of the Russian Federation increases. Every year more than a dozen ISO technical committees meetings in various areas of standardization take place in Russia. 36th ISO General Assembly, held in St. Petersburg in September this year became another step on the way of Russia's integration into the international community. It has also strengthened the authority of our country on the world's arena. Here is the interview of the Rosstandart head G.I. Elkin with the journal of the International organization for standardization ISO Focus+

Key words: international standardization, sustainable development, competitiveness, economy modernization