

Analysis of Updating of the Russian Standards Concerning Requirements Harmonization

O. A. Chudnova
Far Eastern Federal University, FEFU
City of Vladivostok, Russia
chudnova.oa@dvvu.ru

A. D. Potsulin
Far Eastern Federal University, FEFU
City of Vladivostok, Russia
2toni.p.1997@gmail.com

A. S. Shilov
Far Eastern Federal University, FEFU
City of Vladivostok, Russia
ash.21@bk.ru

Abstract – While Russia is putting so many efforts to integrate into the global market, domestic enterprises wishing to expand their markets and to do business with international partners, face the problem of standards harmonization more and more often. Uncompetitive products are not able to withstand competition at the global markets because of their non-compliance with the international requirements. That is why harmonization of standards plays an important role in the development of international industrial cooperation and joint resolution to improve quality assurance. Based on the above considerations, the problem of standards harmonization remains vital and important. This article provides the results of comparative analysis of RF standards in a certain sector of industry based on GOST classifier, and demonstrates evolution of development and harmonization of standards in modern economic environment. Dynamics of harmonization of the Russian Federation National Standards is also revealed. The authors also introduce the criterion to measure the level of standards harmonization.

Keywords – GOST, national standardization system, standard harmonization level, overall sampling, technical regulation.

I. INTRODUCTION

According to the strategy of innovative development of the Russian Federation up to 2020 [1], special attention shall be paid to increase of innovative activity of companies and corporations, strengthening environmental, technical, sanitary and epidemiological requirements, as well as requirements to power and resource consumption intensity for products/services and technologies in use. All these factors lead to rapid harmonization of national standards with international requirements, which implies global change and evolution of national standardization system as a whole.

According to [13], standardization is one of the key factors having an impact on modernization, technological and socioeconomic development of Russia.

National standardization system includes a complex of general technical standards (GOST) and standards by branches of economy, labor safety and health protection standards, and other standardization subsystems, as well as participants of

works in the area of standardization... Activity in the area of products (goods, services) standardization is supported, among other things, by inter-coordinated procedures of planning, development, adoption, update/amendment and cancelling of standardization documents, as well as national standards and all-Russian classifiers of technical, economic and social information, which is used for products/goods/services development, production, operation, disposal and making amends/updates to the same [13]. Important pre-requisite condition for raising the quality and competitiveness of products/goods/services in the current economic environment is harmonization of national and international standards [2, 15, 18]. Based on the above said, the problem of standards harmonization has a vital importance and calls for further research.

II. ANALYSIS AND ASSESSMENT OF STANDARDS HARMONIZATION LEVEL

In the situation of gradual transition to technical regulation, a significant share of GOSTs have become voluntary, while technical regulations have become mandatory to observe, and many product safety standards have been terminated or amended [19]. One should also remember that development and introduction of standards are based on practical recommendations. Therefore, the greater is the practical experience and approbation base for the aspects to be included into the standard, the higher its status should become. Here international standards may come to help, which are developed and adopted in accordance with the procedures approved by the international organization engaged in ISO standardization [4]. Harmonized national standards may be approved in accordance with the procedures under the national legislation. In order to assess the level of standards harmonization, it is necessary to carry out analysis and assessment for actualization of the RF standards in a certain sector of industry, dynamics of implementing national standards and standards harmonization.

To carry out an assessment, analysis of standards of GOST classifier was per-formed [16]. To verify if the requirements of

harmonization and transition to technical regulation were met, the authors performed an analysis with the help of direct counting method, based on one of the seven quality assurance tools, a registration list (control list). To determine selection criteria, three periods of standards actualization were taken as a basis, namely:

- period before 2005;
- period from 2005 to 2015;
- period from 2015 to 2017.

Therefore, we received a multidimensional distributed overall sampling based on a set of National RF Standards, which are currently effective, coming into effect, were replaced and are not currently effective (refer to Fig. 1):

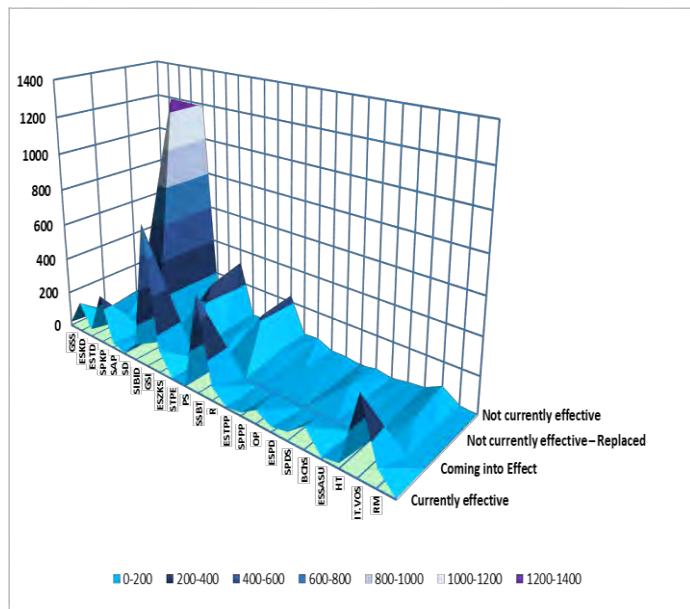


Fig. 1. Multidimensional distributed overall sampling of national standards based on GOST classifier.

- State System of Standardization (GSS, SSS);
- Uniform System of Design Documentation (ESKD, USDD);
- Uniform System of Technological Documentation (ESTD, USTD);
- Quality Rating System (SPKP; QRS);
- Standards for Certified Products (SAP, SCP);
- System of Administrative, Management, Plan and Economic, Recording, Statistical, Accompanying and Other Types of Documents (SD, AD);
- Standards on Information, Librarianship and Publishing. Digital Publishing (SIBID, SILP);
- State System for Ensuring the Uniformity of Measurements (GSI, SSEUM);

- Uniform System of Corrosion and Ageing Protection (ESZKS, USCAP);
- Standards for Exported Goods (STPE, SEG);
- Practical Statistics (PS, PS);
- System of Occupational Safety Standards (SSBT, SOSS);
- Reprography (R, R);
- Uniform System of Technological Preparation of Production (ESTPP, USTPP);
- System of Product Development and Launching it Into Manufacture (SPPP, SPDLM);
- Environment Protection (OP, EP);
- Uniform System for Program Documentation (ESPD, USPD);
- System of Design Documentation for Construction (SPDS, SDDC);
- Safety in Emergency Situations (SES, BChS);
- Unified System of Standards of Computer Control Systems (ESSASU, USSCCS);
- Industrial Product Dependability (HT);
- Information Technology. Open Systems Interconnection (IT.VOS, IT.OSI);
- Risk Management (RM, MR).

Further on, we carried out assessment of dynamics of national standards implementation. Implementation dynamics of national standards based on GOST classifier on the same sampling, after exponential smoothing, showed stable de-cline (refer to Fig. 2).

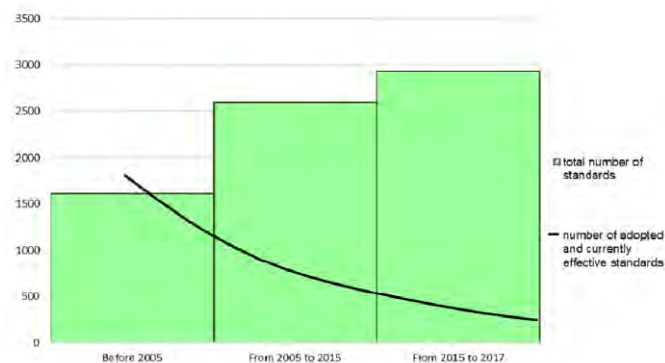


Fig. 2. Dynamics of implementation of national standards based on GOST classifier.

Analysis of harmonization dynamics of National Standards based on GOST classifier was performed only in four sections, such as:

State System for Ensuring the Uniformity of Measurements;

- System of Occupational Safety Standards;
- Information Technology. Open Systems Interconnection;
- Risk Management (Fig. 3).

As for the other sections, the National Standards do not have international analogs.

Analyzing the Fig. 1-3, one may see that in the course of direct analysis of amendments to the national standards based on GOST classifiers and building multidimensional overall sampling, the highest peak falls at the section “Stand-ards for Certified Products” (SAP, SCP) (refer to Fig. 1) under the criteria “Not currently effective.” This list of standards is intended for products having man-datory technical conditions and requirements to the quality of certified products. This fact is explained by introduction of the law “On Technical Regulation”: before that, almost all GOSTs in Russia were mandatory, but after adoption of this law, the standards have become voluntary. The main idea of this law is to introduce a new type of regulatory document in Russia, a technical regulation. Unlike GOST, technical

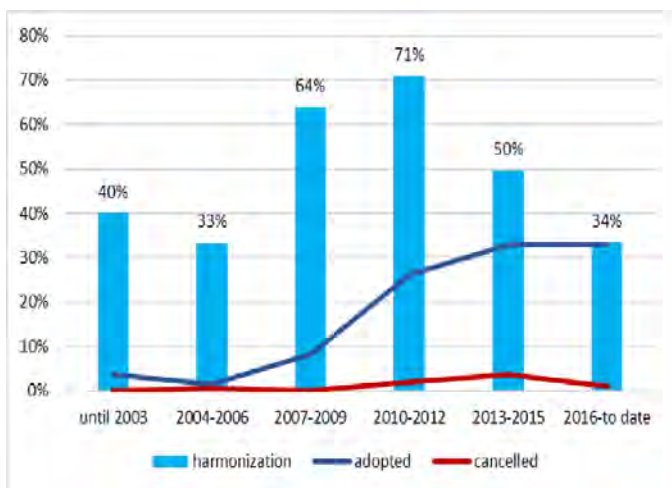


Fig. 3. Harmonization dynamics of standards based on GOST classifier.

regulation is the law, which is mandatory to observe. Therefore, the rate of de-veloping and implementing national standards is declining, which is proved by the demonstrated dynamics of implementing national standards (refer to Fig. 2). Despite the obvious decline as compared with the period up to 2002, where there is no technical regulation available for a product or a service, the Article 46 of the Law “On Technical Regulation” is applied, more precisely the paragraph 6_2,3 [12]. Therefore, there is no saying about the cancellation of all GOSTs; the situation is quite the opposite. For a technical regulation to become viable and efficient, it is necessary to have high quality national and interstate standards. This fact is confirmed by investigation of dynamics of standards harmonization (refer to Fig. 3). A large number of harmonized standards belongs to the section “Information Technology. Open Systems Interconnection”, which number is over 111 standards. As it can be seen from the chart, active harmonization started from 2007. Thus, from 2007 to the

present moment, 195 National Standards were harmonized, 182 of which are currently effective. The peak of harmonization falls at the period from 2010 to 2012. After 2013, insignificant decline is ob-served, which is explained by the fact that the number of standards adopted reached its maximum and a point of saturation (refer to Fig. 3). At this moment, affective are those harmonized standards, which were adopted between 2001 and up to date.

Once we analyzed and assessed the actualization of RF standards in a certain sector of industry, dynamics of national standards implementation and standards harmonization, it is possible to assess the level of standards harmonization.

The level of standards harmonization is a certain functionality, which prereq-uisite is (1):

$$\Phi = \lim_{i \rightarrow \infty} G t_i \Rightarrow 1 \tag{1}$$

Therefore, by harmonization level we understand the output of the finite state of standards harmonization (G) from the earlier prescribed area of required standards (δ), which are currently effective and ensure the quality of products (services etc.). Hence, we may understand by “standards harmonization level” a conditional probability (P) as an accumulative ratio of area of required and currently effective standards ($D | O$) and harmonized standards ($g | O$) to no longer effective standards ($S | O$) on each local level of harmonization ($\Phi(\bullet)$),

$$G(t_i) = P \left[\left(\|D | O + g | O - S | O\| > \delta \right) | \Phi(\bullet) \right] \tag{2}$$

We carried out assessment of standards harmonization level based on (1) and (2); as a result, we obtained dynamics of level of national standards harmonization (Fig. 4).

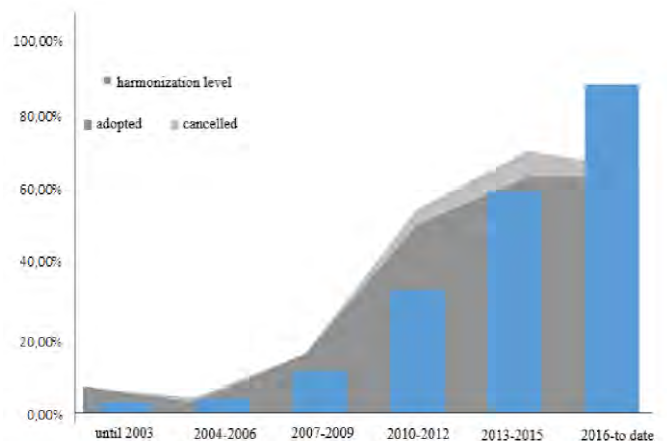


Fig. 4. Dynamics of the level of National Standards harmonization in RF.

The level of national standards harmonization is over 80% and is currently opti-mal for integration into the global market. However, one should bear in mind that we studied here only four sections of GOST classifier, since they have a predom-

inant quantity of harmonized standards, and they account for less than 19% of the total number of sections. If we look at the level of standards harmonization throughout the entire File of Standards, it should drop to 50% for the currently effective standards [7]. For the global practical experience, this value is normal, since many countries with well-developed industry have their national files of standards, about 40% of which do not have the similar international standards. In addition, the conducted analysis reveals weak development of the standards base and lack of its regular update, low level of harmonization of national standards with international ones (refer to Fig 4.). The solution to these problems may be-come innovation technologies and R&D implementation. This way we drew a map for evolution of development and harmonization of standards in modern economic environment.

III. CONCLUSION

In accordance with the strategy of innovative development of the Russian Federation, our country undergoes rapid transition to new economics, which is innovative, science-intensive, resource saving and competitive at the global market [5, 6, 8, 9, 11]. Standardization accompanies innovative products on all stages of their life cycle, starting from their creation (R&D, production organization), commercialization and ending on their operation and disposal. On all of these stages, innovative activity is supported by the whole systems and complexes of standards, including ESTD (USTD), ESKD (USDD), SPPP (SPDLM) and others [10].

This study, which purpose was to conduct competitive analysis of RF standards in a certain sector of industry based on GOST classifier, made it possible to demonstrate evolution of development and harmonization of standards in modern economic environment, to build and analyze dynamics of national RF standards harmonization, to introduce and assess criterion of standards harmonization level. The level of national standards harmonization gives us an opportunity to assess the assurance of domestic products compliance with the international requirements, to analyze the ways of raising their competitiveness and eliminating technical barriers to the international trade [3, 14, 17, 20, 21]. Currently the level of national standards harmonization is over 80% for 19% of sections of GOST classifier under study, and about 50% throughout the entire File of Standards, which is an optimal value for an initial stage of integration into the global market.

References

- [1] About approval of strategy of innovative development of the Russian Federation for the period up to 2020, <http://docs.cntd.ru/document/902317973>, last accessed 2018/04/17.
- [2] A.S. Smirnov, A. Schneider, M.Yu. Frolov, and V.I. Petrov, "Current criteria for studies of drug bioequivalence: harmonization of national standards," *Pharmaceutical chemistry journal*. New York, vol. 48, iss. 5, pp. 303-309, August 2014. – URL: <https://link.springer.com/article/10.1007/s11094-014-1099-2>, last accessed 2018/04/21.
- [3] E.S. Devadason, V.G.R. Chandran, and K. Kalirajan, "Harmonization of food trade standards and regulations in ASEAN: the case of Malaysia's food imports," *Agricultural Economics (United Kingdom)*. Vol. 49, iss. 1, pp. 97-109, January 2018. – URL: <https://onlinelibrary.wiley.com/doi/10.1111/agec.12398>, last accessed 2018/04/21.
- [4] V. Vlasov, I. Konin, P. Pribyl, and V. Bogumil, "Development of Standards and Their Harmonization with International Standards as a Necessary Condition of Normative and Technical Support in Construction and Development of Intelligent Transport Systems in Russia," 12th International Conference on Road Organization and Safety in Big Cities, *Transportation Research Procedia*. Amsterdam, vol. 20, pp. 690-694, 2017. – URL: <https://www.sciencedirect.com/science/article/pii/S2352146517301126>, last accessed 2018/04/21.
- [5] M.Y. Veselovsky, T.V. Pogodina, R.V. Ilyukhina, T.A. Sigunova, and N.F. Kuzovleva, "Financial and economic mechanisms of promoting innovative activity in the context of the digital economy formation," *Entrepreneurship and Sustainability Issues*. Vol. 5, iss. 3, pp. 672-681, March 2018. – URL: <https://jssidoi.org/jesi/article/175>, last accessed 2018/04/21.
- [6] N. Golubetskaya, T. Kosheleva, and V. Kunin, "Problems of innovative development of an entrepreneurship in the industry in the conditions of upgrade of Economy," *IOP Conference Series: Earth and Environmental Science*. Vol. 90, iss. 1, art. numb. 012049, 2017. – URL: <http://iopscience.iop.org/article/10.1088/1755-1315/90/1/012049/meta>, last accessed 2018/04/20.
- [7] G.N. Ivanova, N.V. Androsenko, and N.E. Tsymbal, "System of technical regulation in Russia: development of international cooperation in the field of standardization," *Problems of territory development*, 4 (78), 58-68, 2015.
- [8] M. Kaneva and G. Untura, "Innovation indicators and regional growth in Russia," *Economic Change and Restructuring*. New York, vol. 50, iss. 2, pp. 133-159, May 2017. – URL: <https://link.springer.com/article/10.1007/s10644-016-9184-z>, last accessed 2018/05/01.
- [9] E. Kharchenko and I. Garbuz, "Mechanisms of national economy and its regions adaptation to the conditions of integration to the world economy," *Economic Annals-XXI*. Kyiv, vol. 157, iss. 3-4, pp. 28-31, May 2016. – URL: <http://soskin.info/userfiles/file/Economic-Annals-pdf/DOI/ea-V157-0008.pdf>, last accessed 2018/05/01.
- [10] A.V. Kupriyanov, "Quality assurance and food safety system," *Vestnik of Orenburg State University*, 3 (164), 164-167, 2014.
- [11] D.A. Maryasis, "Russian strategy of entering the innovation markets of the Middle East," *MGIMO Review of International Relations*. Moscow, iss. 4, pp. 154-164, 2017. – URL: http://www.vestnik.mgimo.ru/sites/default/files/vestnik/2017-55-4/010_mar.pdf, last accessed 2018/04/21.
- [12] On technical regulation Federal Law № 184-FZ, <http://docs.cntd.ru/document/901836556>, last accessed 2018/05/03.
- [13] On the Concept of the Development of the National System of Standardization of the Russian Federation for the Period to 2020, <http://docs.cntd.ru/document/902371448>, last accessed 2018/04/21.
- [14] C. Pekdemir, "On the regulatory potential of regional organic standards: Towards harmonization, equivalence, and trade?," *Global Environmental Change*. Vol. 50, pp. 289-302, May 2018. – URL: <https://www.sciencedirect.com/science/article/pii/S0959378016302813>, last accessed 2018/05/03.
- [15] B. Pozdnev and others, "Quality assurance of learning processes based on standards," *ICERI 2016: 9th International Conference of Education, Research and Innovation*. Valencia, pp. 4920-4927, November 2016. – URL: http://apps.webofknowledge.com/full_record.do?product=WOS&search_mode=GeneralSearch&qid=13&SID=D2RUq9TtXjfrCJNlk9D&page=1&doc=7, last accessed 2018/04/21.
- [16] Reference and legal information and search system NormaCS, <http://www.normacs.ru>, last accessed 2018/04/28.
- [17] E.N. Sawyer, W.A. Kerr, and J.E. Hobbs, "Consumer preferences and the international harmonization of organic standards," *Food Policy*. Vol. 33, iss. 6, pp. 607-615, December 2008. – URL: <https://www.sciencedirect.com/science/article/pii/S030691920800033X?via%3Dihub>, last accessed 2018/04/29.

- [18] M. Shamtsyan, "Food legislation and its harmonization in Russia," *Journal of the Science of Food and Agriculture*. New Jersey, vol. 94, iss. 10, pp. 1966-1969, August 2014. – URL: <https://onlinelibrary.wiley.com/doi/full/10.1002/jsfa.6197>, last accessed 2018/04/29.
- [19] I.A. Shapovalov, "Form of acts of technical regulation in Russia: experience of critical interpretation of the legislation on technical regulation," *Vestnik of the Russian State Humanitarian University*, 3 (83), 20-28, 2012.
- [20] A.Yu. Ramenskiy, S.A. Grigoriev, E.A. Ramenskaya, and A.S. Grigoriev, "Technical regulation issues concerning fuel cell technologies in the Russian Federation, countries of the Eurasian Economic Union and CIS countries," *International Journal of Hydrogen Energy*. Vol. 42, iss. 33, pp. 21250-21262. August 2017. – URL: <https://www.sciencedirect.com/science/article/pii/S0360319917323042>, last accessed 2018/04/21.
- [21] D. Curzi, M. Luarasi, V. Raimondi, and A. Olpe, "The (lack of) international harmonization of EU standards: import and export effects in developed versus developing countries," *Applied Economics Letters*. Routledge, pp. 1-5, January 2018. – URL: <https://www.tandfonline.com/doi/full/10.1080/13504851.2018.1430327?scroll=top&needAccess=true>, last accessed 2018/05/03.