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Content

Biological sciences

Economic sciences

Geographical sciences

Jurisprudence

Pedagogical sciences

Philological sciences

Philosophical sciences

Physical sciences

Technical sciences

Biological sciences

TO STUDIES ON TRUE BUGS (HETEROPTERA, PENTATOMOMORPHA) OF GARABAGH TERRITORY OF AZERBAIJAN

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Heteroptera of Azerbaijan was studied by A.Atakishiyeva, I.S.Drapolyuk and J.Hydayatov. The researches of the last author were carried out on Pentatomomorpha particularly. From 564 Pentatomomorpha species recorded in the territory of Azerbaijan 67 ones distributed in Garabagh. They are have been recorded from Shusha, Khankendi, Khojaly, Khojavend, Aghdam, Aghdara, Fizuli, Zangilan, Kalbajar, Lachin, Tartar, Jabrayil and Hadrud. The list of the true bug species distributed in Garabagh is presented below.

1. *Aneurus laevis* (Fabricius, 1775)
2. *Artheneis hyrcanica* (Kolenati, 1845)
3. *Bagrada concinna* Horváth, 1936
4. *Bagrada monticola* Horváth, 1936
5. *Bathysolen nubilus* (Fallén, 1807)
6. *Berytinus clavipes* (Fabricius, 1775)
7. *Berytinus hirticornis nigrolineatus* (Jakovlev, 1903)
8. *Berytinus minor* (Herrich-Schäffer, 1835)
9. *Berytinus setipennis* (Saunders & E. 1876)
10. *Bleteogonus beckeri* (Frey-Gessner, 1863)
11. *Bothrostethus annulipes* (Herrich-Schäffer, 1835)
12. *Brachynema germarii* (Kolenati, 1846)
13. *Canthophorus wagneri* Asanova, 1964
14. *Capnoda caucasica* Horváth, 1897
15. *Dicranocephalus setulosus* (Ferrari, 1874)
16. *Dimorphopterus doriae* (Ferrari, 1874)
17. Distribution in the other provinces of Azerbaijan: Khizi, Altiagach.
18. *Drymus pilipes* Fieber, 1861
19. *Elasmostethus interstinctus* (Linnaeus, 1758)
20. *Emblethis brachynotus* Horváth, 1897
21. *Enoplops disciger* (Kolenati, 1845)
22. *Eremocoris fraternus* Horvath, 1883
23. *Geocoris arenarius* (Jakovlev, 1867)
24. *Heterogaster artemisiae* Schilling, 1829
25. *Heterogaster cathariae* (Geoffroy in Fourcroy, 1785)
26. *Holcocranum saturejae* (Kolenati, 1845)
27. *Xanthochilus quadratus* (Fabricius, 1798)
28. *Xanthochilus omissus* (Horváth, 1911
29. *Xanthochilus saturnius* (Rossi, 1790)
30. *Irochrotus lanatus* (Pallas, 1773)
31. *Ischnocoris punctulatus* Fieber, 1861
32. *Ischnodemus caspius* Jakovlev, 1871
33. *Lamprodema maurum* (Fabricius, 1803)
34. *Lasiocoris anomalus* (Kolenati, 1845)

35. *Lasiocoris antennatus* Montandon, 1889
36. *Leptodemus minutus* (Jakovlev, 1874)
37. *Megalonotus chiragra* (Fabricius, 1794)
38. *Megalotomus ornaticeps* (Stål, 1858)
39. *Metopoplax origani* (Kolenati, 1845
40. *Microporus nigritus* (Fabricius, 1794)
41. *Myrmus miriformis* (Fallén, 1807)
42. *Nysius cymoides* (Spinola, 1837)
43. *Nysius graminicola* (Kolenati, 1845)
44. *Nysius senecionis* (Schilling, 1829)
45. *Ortholomus punctipennis* (Herrich-Schäffer, 1838)
46. *Paraparomius leptopoides* (Baerensprung, 1859)
47. *Paromius gracilis* (Rambur, 1839).
48. *Pausias martini* (Puton, 1890)
49. *Peritrechus lundii* (Gmelin, 1790)
50. *Phyllomorpha lacerata* Herrich-Schäffer, 1835
51. *Phyllomorpha laciniata* (Villers, 1789)
52. *Platyplax salviae* (Schilling, 1829)
53. *Plinthisus longicollis* Fieber, 1861
54. *Pterotmetus staphyliniformis* (Schilling, 1829)
55. *Rhopalus parumpunctatus* Schilling, 1829
56. *Sciocoris helferi* Fieber, 1851
57. *Sciocoris macrocephalus* Fieber, 1851
58. *Scolopostethus lethierryi* Jakovlev, 1877
59. *Sehirus parens* Mulsant & Rey, 1866
60. *Spathocera dalmanii* (Schilling, 1829)
61. *Stictopleurus crassicornis* (Linnaeus, 1758)
62. *Stygnocoris sabulosus* (Schilling, 1829)
63. *Tarisa virescens* Herrich-Schaeffer, 1851
64. *Tholagmus flavolineatus* (Fabricius, 1798)
65. *Tritomegas bicolor* (Linnaeus, 1758)
66. *Tropistethus fasciatus* Ferrari, 1874
67. *Tropistethus holosericeus* (Scholz, 1846)

COMPARISON OF BIOCHEMICAL COMPOSITION OF PROMISING SOYBEAN SEED SPECIES IN THE CONDITIONS OF CHUI VALLEY

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The article reflects the main indicators of chemical composition of American and Russian soybean species seeds. In 2019 y., field experiments and research have been carried out in the conditions of Chui Valley. Nowadays it is considered that soybean - major source of plant protein and it occupies a leading position in the production of vegetable oil in world production. Its biochemical composition of seeds is rich and varied depending on the species. In the course of research, we studied the biological and morphological characteristics of the tested soybean species. At the end of its growing season and physiological ripeness, a crop was harvested from these species - Emerge 2t29, Emerge 2282, Slavia, Vilana, Ultra. The amount of proteins, lipids, carbohydrates, as well as the qualitative composition of these groups of substances in soybean seeds vary significantly depending on the varietal characteristics and cultivation conditions of the crop. After researching and comparing, we can conclude that American species are superior to others in protein content, and Russian varieties are superior in fat content in seeds. In this connection, it can be recommended to local agronomists to cultivate it in large volumes, considering with the conditions.

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DIURNAL ACTIVITY OF BUMBLEBEES

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СУТОЧНАЯ АКТИВНОСТЬ ШМЕЛЕЙ

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Шмели (Hymenoptera, Apidae), как активные опылители, являются элементом любой экосистемы, включающей энтомофнльные растения. Наиболее значима их роль в бореальных и горных экосистемах, где благодаря ряду морфолого-экологических особенностей они важнейшие опылители. (1). Изучение суточной активности шмелей имеет большое практическое значение, так как биотические и абиотические факторы сильно влияют на фуражиров.

Исследования для изучения влияния некоторых абиотических факторов (температура, влажность и пасмурность) на суточную фуражировочную активность шмелей проводились в двух стационарных участках Азербайджанской Республики: Газахский район, село Дамирчилер (41°05′16″ с. ш.45°15′53″ в. д.) и Нахичеванская АР, Ордубадский район, Агдара (39°06′37″ с. ш. 45°54′50″ в. д.). На первом участке проводились наблюдения на 2 (*B.argillaceus* и *B.zonatus*), на втором – на 5 (*B.incertus, B.handlirscianus, B. subterraneus, B.shcaposhniklovi, B.jonellus*) видах шмелей. В селе Дамирчилер шмели собраны на фруктовых деревьях, на розмарине, сафлоре и бодяке, в Агдере на шалфее, тимьяне и ежевике. Результаты приводятся в диаграммах 1,2.

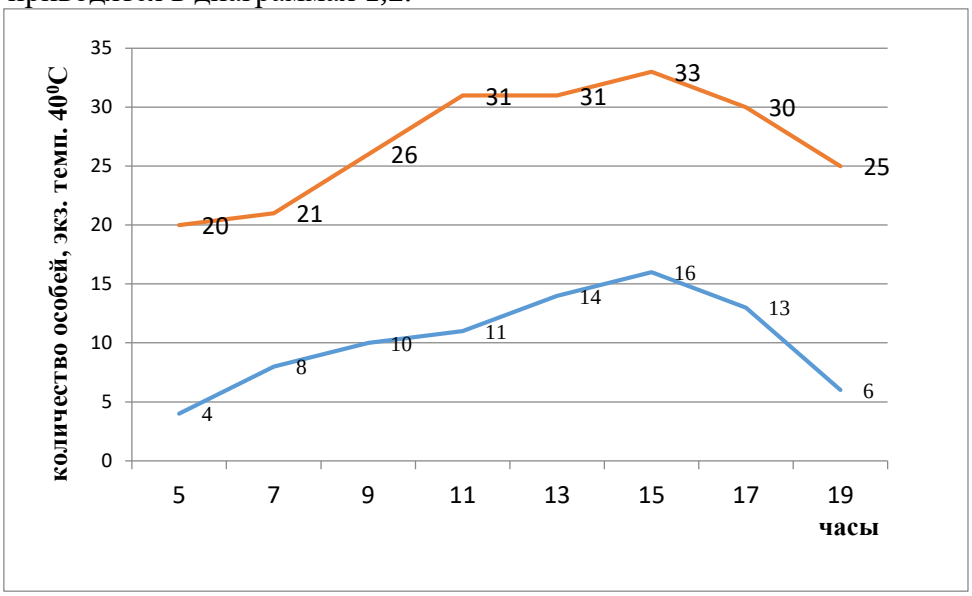

Диаграмма 1. Суточная фуражировочная активность шмелей (Нахичеванская АР, Ордубадский район , Агдере, 2000-2500 м н.у.м. 08.07.2022)

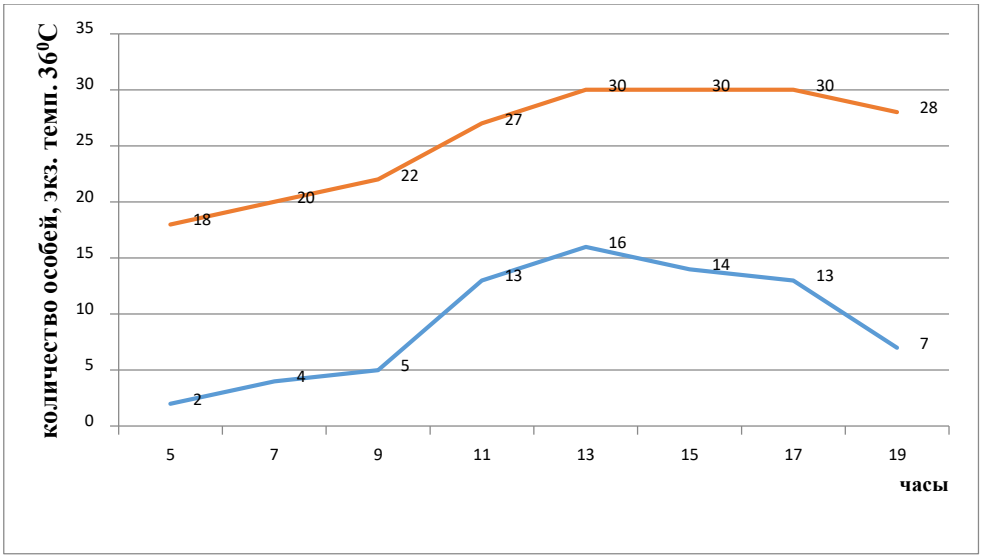

Диаграмма 2. Суточная фуражировочная активность шмелей (Газахский район, село Дамирчилер, 580 м н.у.м., 20.06.2022)

Выявлено, что пик активности лета наблюдается между 12^{00}-17^{00} часами. Шмели могут работать уже при температуре 8-10 ^{0}C , но для стабильного лета оптимальная температура 22-24 ^{0}C и влажность 50-60%.

В горных регионах при невысокой температуре воздуха (не выше 35 ^{0} C) и высокой влажности в отличие от медоносных пчел шмели начинают лет уже с раннего утра (3^{00}-4^{00}) до позднего вечера (20^{00}) и активно работают. В результате наблюдений выявлено, что рано утром, при сравнительно низкой температуре воздуха - 16-18 ^{0}C, в пасмурную погоду, при наличии на цветках росы и в сумерках встречаются работающие отдельные особи шмелей Суточная активность пчел зависит и от других факторов, например, от видов нектароносов, от длины светового дня, в какое время суток растение выделяет максимальное количество нектара, от стадии развития пчелиной семьи, с какой целью пчела посещает цветок (для сбора пыльцы или нектара) и др.

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MANTIDFLIES (NEUROPTERA, MANTISPIDAE) DISTRIBUTED IN AZERBAIJAN

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Mantidflies or mantispids are worldwide distributed small or moderate-sized insects from the order Neuroptera. They are richer in the tropics and subtropics. The total number of mantidflies in the world is about 410 species (Ohl,2007). The imago and larvae of mantidflies are predators. The larvae feed on eggs of spiders in the egg sacs (Redborg, 1998).

In Azerbaijan, the mantispids are rarely encountered in the field and are poorly studied. Basic information on their taxonomy, ecology, distribution, and behavior is lacking. We investigated the mantispids fauna of Azerbaijan from 2012 to 2022 in the whole territory of the republic. The species were collected with sweeping net, entomological umbrella and some specimens attracted to light. Collected materials are located in the Institute of Zoology, Azerbaijan.

The research has resulted in the recording of 5 species and 1 variation: *Mantispa adelungi* Navás, 1912, *Mantispa aphavexelte* U. Aspöck & H. Aspöck, 1994, *Perlamantispa perla* (Pallas, 1772), *Mantispa perla var. lobata* Navás, 1912, *Mantispa scabricollis* McLachlan, 1875, *Mantispa styriaca* (Poda, 1761). They have been recorded in the Greater Caucasus, Lesser Caucasus, Kura-Araz lowland, Nakhchivan, and Lankaran. All species were recorded mainly in Nakhchivan. *M. aphavexelte, P.perla, M. styriaca* were recorded in the Greater Caucasus, Lankaran, and Kura-Araz lowland also. *M.adelungi* was recorded in the Kura-Araz lowland only. From these species two have been included in the third edition of Red Book of the Azerbaijan Republic: *M.styriaca* and *M.aphavexelte*. The first species was included in the Red Book under the rarity status EN and the second one under the status DD (Kerimova, 2022).

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PHYTOCHEMICAL ANALYSIS OF SEDUM HYBRIDUM L. EXTRACTS AND THEIR PHARMACOLOGICAL PROPERTIES

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The aim of our study was to identify the greatest possible amount of biologically active substances from plant parts *Sedum hybridum* L. in different phases of vegetation in ontogenesis and compare different periods of maturation: juvenile, vegetative and adult plants.

Like one of the families of the plant world on Earth, the Family of Crassulaceae *shrubs and in rare cases, trees, but they are all succulents. Thus, it determines their significance in global climate change and the preservation of terrestrial vegetation from desertification to 90% of the total species diversity by mid-2050* [1].

The uniqueness of this succulent plant is relevant for studying it *phytochemical composition as a promising source* biologically active components that determine medicinal properties *Sedum hybridum* L. *and suggest it as a more suitable candidate broad-spectrum herbal medicine in the future.*

Moreover, the literature data indicate the use of types of Sedums in folk medicine and homeopathy of different countries. There are descriptions of some species of this plant that have pharmacological properties and are used in folk medicine in the treatment of several common diseases such as: epilepsy, inflammation of the upper respiratory tract, burns, liver diseases, hemorrhoids, in the treatment of purulent wounds, anemia, nephritis, fever, turbeculosis and severe infections that require further study in the future. defining subspecies [2,3]. An integral part of this succulent is its antiseptic, antibacterial, hemostatic, antiviral, diuretic and tonic properties *[4*-7]. All the above valuable therapeutic benefits *Sedum hybridum* L. they are manifested due to the presence in medicinal plant raw materials of such active substances as alkaloids, tanninsbut, gum and rutin, and others [8,9].

We analyzed extracts of plant raw materials in different phases of vegetation and growth periods, using the gas chromatography method with mass spectrometric detection Thus, in the composition of different phases of vegetation of ontogenesis, classes of compounds were identified as: phenols, diterpenes, terpenes, ketones, alcohols, pyrans, monosaccharides, tetrahydrofurans, esters, aromatic acid, carbohydrates, fatty acids, acids, essential oils, organic substances, and tocopherols.

All identified classes of compounds have therapeutic potential in the treatment of the above-mentioned topical diseases and have the following properties: It has antiseptic, antibacterial, hemostatic, antiviral, diuretic, and tonic properties.

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QUALITATIVE AND QUANTITATIVE STRUCTURE OF THERIOFAUNA SAMUR-DEVECHIN LOWLAND AND GONAGKEND DISTRICT OF AZERBAIJAN

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КАЧЕСТВЕННАЯ И КОЛИЧЕСТВЕННАЯ СТРУКТУРА ТЕРИОФАУНЫ САМУР-ДЕВЕЧИНСКОЙ НИЗМЕННОСТИ И ГОНАГКЕНДСКОГО РАЙОНА АЗЕРБАЙДЖАНА

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Самур-Девечинская низменность простирается на северо-востоке Азербайджана вдоль Каспийского моря, на юге ограничена Боковым хребтом, а ее северо-западная граница следует по реке Самур. Гонагкендский физико-географический район занимает площадь от водораздела гор Большого Кавказа до Самур-Девечинской низменности. Растительность меняется от полупустынного и низинно-лесного приморского пояса до горно-лесного в высокой юго-западной части (Мусеибов М.А., 1961).

В связи с малоизученностью териофауны этих районов нами было проведено исследование в период с 2017 по 2022 гг. Анализ результатов исследований и литературных данных (Алекперов Х.М., 1966; Эйгельс Ю.К., 1980; «Животный мир Азербайджана III, позвоночные» 2000; Рахматулина И.К., 1989; Кулиев С.М., 1997) показал, что териофауна Самур-Девечинского и Гонагкендского районов Азербайджана представлена 55 видами, которые относятся к 6 отрядам, 20 семействам и 38 родам.

Отряд Insectivora Bowdıch, 1821 – Насекомоядные представлен 3 семействами: Ежовые - Erinicidae Fischer Von Waldheim, 1817 с 2 родами (*Erinaceus* L.1758 – *E. concolor* Martin,1838, *E.roumanicus* Barret Hamiltonc 1900, *Hemiechinus* Fitzinger, 1866 – *H. auritus* Gmelin, 1770); Кротовые - Talpidae G.Fischer,1814 - с 1 родом Talpa 1758 (*T. levantis* Thomas, 1906), и Землеройки- Soricidae Fischer Von Waldheim, 1817 с 4 родами: Sorex L.1758 (*S. raddei* Satunin,1895, *S. satunini* Ognev, 1922); Neomys Kaup, 1829 (*N. teres Miller,1908*); *Suncus* Ehrenberg,1833 (*S. etruscus* Savi, 1822); *Crocidura* Üagler,1832 (*C. suaveolens* Pallas,1811, *C.leucodon* Hermann,1780, *C. gueldenstaedti* Pallas,1811).

Отряд Рукокрылые - Chiroptera Blumen Bach,1779 представлен 2 семействами: Подковоносы - Rhinolophidae Gray, 1825 с 1 родом *Rhinolophus* Lacepede,1799 (*R. hipposideros* Borkhausen,1797, *R. blasii* Peters,1866); Гладконосы - Vespertilionidae Gray,1821 с 6 родами: *Myotis Kaup, 1829 (M.emarginatus noctula* Schreber,1774), *Pipistrellus* Kaup,1829 (*P. nathusii* Keyserling et Blazius,1839, *P. kuhlii* Kuhl,1817), *Vespertilio* Linnaeus, 1758 (*V. murinus* L.,1758), *Eptesicus* Rafinesque,1820 (*E. serotinus* Schreber,1774).

Отряд Зайцеобразные - Lagomorpha Brandt,1855 представлен 1 семейством Leporidae G.Fisch.Waldh., 1817, 1 родом - Linnaeus, 1758 и 1 видом *L. europaeus* Pallas, 1778.

Отряд грызунов - Rodentia Bowdich, 1821 представлен 6: семействами: Беличьи - Scuridae, Gray,1821 род *Sciurus* L.,1758 с 1 видом (*S. anomalus* (Gmelin, 1778); Дикобразовые - Hystricidae Burnett, 1830 1 род *Hystrix* Linnaeus, 1758 с 1 видом (*Hystrix indica* Kerr.1792); Соневые - Gliridae Thomas,1897 включает 2 рода - *Glis* Brisson, 1762, с видом *G. glis* L.,1766 и Dryomys Thomas,1906 с видом - *D. nitedula* Pallas,1778, Тушканчиковые - Dipodidae Waterhouse,1842 представлено 1 родом *Allactaga* F.Cuvier,1836 с 2 видами (*A. euphratica* Thom,1881, *A. elater* Licht.,1825), Хомяковые - Cricetidae Fischer Von Waldheyn,1847, род

Crisetulus Milne-Edwards,1867 с 1 видом (*C. miqratorius* Pallas, 1773); род *Meriones* İlliger, 1811 с 1 видом (*M. libycus* Lichtenstein,1823); род *Arvicola* Lacepere, 1801 с 1 видом (*A. amphibius* L., 1758); род *Migrotus* Schrank, 1798 с 3 видами (*M. majori* Thomas, 1906, *M. sosialis* Pallas, 1773, *M.arvalis Pallas,1799*); род *Chionomys* Miller,1908 с 1 видом (*C. nivalis* Martins,1842), Мышиные - Muridae Thomas, 1896 включает в себя род *Micromys* Daehne, 1841 с видом (*M. minutus* Pallas,1771), род Rattus Fischer Von Waldheyn, 1803 с 2 видами (*R. rattus* L.,1758, *R. norvegicus* Berk.,1769); род Mus L.1758 с видом (*M. musculus* L.,1758); род *Apodemus* Kaup, 1829 с видом (*A. agrarius* Pallas,1771); род *Sylvaemus* Ognev,1924 с 3 видами (*S. uralensis* Pallas,1811, *S.witherbyi* Thomas, 1902, *S. ponticus* Sviridenko,1936).

Отряд Хищники - Carnivora Bowdich, 1821 представлен 5 семействами: Волчьи - Canidae Gray, 1821, которое включает род *Canus* L.1758, в 2 видами (*C.lupus* L.,1758, *C. aureus* L.,1758) и род Vulpes Oken,1816 (*V. vulpes* L.,1758), Медвежьи - Ursidae Gray,1825 включает 1 род Ursus L.,1758 и вид (*U. arctos* L.,1758)., Енотовые - Procyonidae Bonaparte,1850 включает 1 род Procyon Storr,1780 с 1 видом (*P. lotor* L.,1758), Куньи - Mustelidae Swinsonç 1835 представлено родом Myustela L.,1758 с 1 видом (*M. nivalis* L.,1758), родом Martes Pinel, 1792 с видом *M.martes* L.,1758, родом Meles Brisson,1762 (*M.meles* L.,1758), Кошачьи - Felidae Gray, 1821 включает род Felis L.,1758 с 2 видами (*F. silvestris* Schreber,1777, *F. libyca* Forster,1780) и родом Lynx Kerr,1792 (*L.lynx* L.,1758).

Отряд Парнокопытные Arthiodactyla Owen,1848 представлено 2 семействами: Свиные - Suidae Gray,1821 с родом Sus Linnaeus,1758 (*S. scrofa* L., 1758) и Оленевые - Cervidae Gray,1821 с родом Capreolus Gray,1821 (*C. capreolus* L.,1758).

Как видно, наиболее многочисленным является отряд грызунов, к которому относится 20 видов, что составило 36,3% от общего числа видов.

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Economic sciences

SELECTION APPROACH FOR SEAPORT DEVELOPMENT PRIORITIES

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Abstract

The article describes the objectives of seaport development management and identifies the directions of development. The authors have identified strategic priorities for the development of the seaport by systematizing and processing the links of the business process system, the objectives of managing the ports development and development directions through the hierarchical synthesis use. The selection of the highest priority will optimize the port development target ratios.

Introduction

In the context of the modern development of the state of transport, enterprises indicate that their activities are fraught with a number of problems, the counteraction of which arises in the strategic or operational plan of functioning. Negative trends can manifest themselves in different spheres of the economy, sometimes reaching a great depth and scope of influence**.**

Main part

The enterprise as a system functions in close connection and interaction with the external environment. The external factors of seaports development include the following: factors of modern geopolitics, quality of interrelations of enterprises with contractors and service customers; development of macroeconomic environment; development of engineering and technology at macroeconomic level; market coverage; availability of resource suppliers; characteristics of competition in the industry.

Besides, seaports (SP) are subject to the influence of internal environment factors, such as management parameters (development strategy, organizational structure, market image, etc.), technological parameters of resources transformation, level of technical equipment of ports and technologies, level of internal port communications, etc. In addition to the factors considered, there are also often factors of ecological changes, human interests in society, the general condition of the world economic system, etc. When identifying the main directions of port development, it is necessary to consider the impact of the above-mentioned factors. The influence of external environment factors will manifest in the form of factors that affect the input parameters of the seaport system, and the output (product) of this system will affect the external environment of the functioning of the transport industry enterprise.

Priorities for the development of seaports that allow the achievement of the highest set of performance indicators or activity efficiency can be identified by analyzing the impact of the organization of port activities built according to the process management model. Business processes encompass a multitude of links between divisions that transfer key tasks to each other in a certain sequence and order (1). Over time, the request turns into the result (output) of the process - a work or service (2). In this case, not only an external customer (e.g., cargo owner and sea line) but also another process (e.g., the output (result) of auxiliary repair processes in SP is technically serviceable equipment, ready to perform the process of cargo handling in the port or passenger service).

Outputs of a business process manifest themselves in the creation of material or informational objects (services, works), which are the results of the business process execution and can be consumed by an external or internal customer. The output of business processes is described by a set of resources, which while performing work on the process, taking into account the available technology, will be converted into an output that has value to the client. Any business process has a certain goal,

which is manifested in the form of criteria for its effectiveness. The goals of business processes are the goals of the lower level, through the implementation of which it is possible to achieve the goals of the upper level - including the goals of enterprise development. The main objectives of seaport development management (SDM) can include the following:

1. Growth of the efficiency of transshipment functions and cargo handling in seaports (EP).
2. High level of customer orientation (orientation - sea line) (COP).
3. Long-term stable relationships and interaction with cargo owners (LR).
4. High level of service quality in seaports (HQ).
5. Growth of sustainability earnings in the short and long term (SE).
6. Growth of strategic potential (resources, production base, technologies, etc.)
7. Increasing the level of transparency and flexibility of the internal communication system of the seaport (TF).

Achievement by seaports of the criteria of the first level, namely, the development goal, may eventually lead to an increase in targets - indicators of the cargo turnover of seaports. The criteria for the second level are determined by the directions of development of seaports:

Fig.1. Hierarchy of interrelationships of seaports development elements

Target indicator for the development of SP

DMG

BP

DD

The upper-level criterion is the target for the development of the seaport

The criterion of the 1st level of the hierarchy - development management goals

The criterion of the 2nd level of the hierarchy - the direction of development of the seaport

The criterion of the 3rd level of the hierarchy - types of business processes of the seaport

The upper-level criteria are described by the seaports' cargo turnover indicator (N). The criteria of the first level of the hierarchies are built depending on the goal of managing the development of ports and are divided into the following main positions:

1. Growth of the efficiency of transshipment functions and cargo handling in seaports (EP).
2. High level of customer orientation (orientation - sea line) (COP).
3. Long-term stable relationships and interaction with cargo owners (LR).
4. High level of service quality in seaports (HQ).
5. Growth of sustainability earnings in the short and long term (SE).
6. Growth of strategic potential (resources, production base, technologies, etc.)
7. Increasing the level of transparency and flexibility of the internal communication system of the seaport (TF).

Achievement by seaports of the criteria of the first level, namely, the development goal, may eventually lead to an increase in targets - indicators of the cargo turnover of seaports. The criteria for the second level are determined by the directions of development of seaports:

1. Infrastructure development (equipment, technologies, material and technical potential) (I).
2. Development of resource potential (all types of resources - labor, material, financial, information) (D).
3. Development of seaports as subjects of the external transport market (place in the external environment)
4. Development of the internal environment (systems of processes, the level of perfection of internal port communications, etc.)

Fig.2. Description of the most significant links between the elements and priorities of the seaports development system

The criteria of the second level of the hierarchy have different significance in identifying the development goal, which is described at the first level of the hierarchy.

The criteria of the third level represent alternative options for performing work and represent groups of business processes of seaports, allocated according to a functional attribute (main business processes - MBP, providing - PBP, development processes (DBP), and management (MPU). Based

on the results of expert surveys, we processed the obtained data and obtained the following research results: a group of main business processes is a more important group when choosing management objects in the seaport development management system.

We have presented the results of processing the results of an expert opinions survey on the development of seaports of the Republic of Azerbaijan. Using the method of analysis of hierarchies, we have processed and obtained data that indicate the following dependencies of the parameters of the development of seaports. The priorities for the development of interrelated elements of the system are identified based on calculations of weighted average significance estimates of the studied parameters. Bearing in mind the high importance of certain types of business processes in achieving the target indicators for the development of seaports (indicators of cargo turnover, income, and profitability of port activities) we will reflect in Figure 2, the result of processing expert estimates.

Conclusion. Based on the results of the research done, we concluded that by managing a group of business processes, that have a primary impact on the level of development of seaports, it is possible to achieve the highest performance indicators and efficiency of their functioning.

MANAGEMENT PRINCIPLES FOR THE DEVELOPMENT OF THE SEAPORT ON THE BASIS OF THE MODULAR BUSINESS PROCESS CHANGES

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Abstract

The article defines the concept and provides a composite module of the seaport business processes in the form of changes in the order and functions performed and performed within the framework of technologies, as well as the conditions for the flow of business processes associated with the replacement of elements of the resource, control and incoming modules under the influence of factors defining the necessary changes to the output module of the business process. The presented scheme of the influence of modular changes in business processes on the development of the seaport allows you to see the direction of their influence in the implementation of certain areas of port development related to changes in infrastructure, resources, internal environment and port communications, as well as directions for the development of the port as a subject of the external environment – the maritime shipping market.

Introduction

A quantitative description of business processes through a system of indicators, which allows for operational control and management, as well as determining the most appropriate ways for the development of the port based on the process model, led to the need to visualize the structure and environment of the main business processes. The need for modular changes is caused by numerous and diverse factors that cause new requirements for the conditions for the flow of business processes in seaports, which, in turn, set the task of developing infrastructure and resources. A technological and organizational platform for business process management. Previous studies [1] in terms of describing the process model of a seaport make it possible to adjust the parameters and conditions for the functioning of its main business processes through modular changes in processes, namely, creating new conditions or adjusting traditional schemes for the execution of port operations or adjusting their sequence and occupancy, and also the conditions for the application, use and modification of input and output modules of processes**.**

Main part

The structure of the business process in research is presented as a set of characteristics of inputs (incoming resources, resource tools, and control inputs) and outputs, and quantitatively describing their indicators. The environment of business processes is presented in the form of factors of influence that determine the nature and conditions of the flow of business processes, the dynamics of changes in the characteristics of business processes, and indicators that describe their functioning. Such a representation of business processes will allow us to highlight the most important ways to optimize those elements called modules in research (Fig. 1).

Figure 1. *Description of the modules of the main business processes of the seaport*

Management of MBP
Inputs of MBP
Borders
Factors
Indicators
Outputs of MBP
Functioning of MBP
Tools (resources) of MBP
Main Business Process (MBP)
Modules of MBP

Thus, business process modules are understood as a system of characteristics of inputs and outputs of the main business processes of the seaport, indicators that describe their functioning, as well as factors that affect individual borders and parameters of business processes (Fig. 2).

Figure 2. *Composition of the modules of the i-th main business process of the port*

Module "MBPi inputs" (M1i)

Borders - incoming resources of the MBPi

Factors that determine the conditions for the use and change of incoming resources of the MBPi

Indicators reflecting the magnitude and dynamics of changes of the incoming resources of the MBPi

Module "Management of MBPi" (M2i)

Borders – management resources of the MBPi

Factors that determine the conditions for the use and changes of the management resources of the MBPi

Indicators reflecting the magnitude and dynamics of changes of the management resources of the MBPi

Module "Tools of MBPi" (M3i)

Borders - used resources of the MBPi

Factors that determine the conditions for the use and changes of the used resources of the MBPi

Indicators reflecting the magnitude and dynamics of changes of the used resources of the MBPi

Module "MBPi outputs" (M4i)

Borders - outputs (product) MBPi

Factors that determine the requirements for changes of the MBPi product

Indicators reflecting the magnitude and dynamics of change, the effectiveness of the outputs of the MBPi

For an example of a description of a business process module, Table 1 shows information grouped by the module of outputs of such business processes as "admission of cargo to the port", "handling of cargo in the port", "exit of cargo from the port" in relation to work with container cargo. Modular changes in the business process of a seaport are changes in the order and sequence of functions, works, and operations within the framework of the process technology, as well as the conditions of the business process, associated with the replacement of elements of the resource, control and incoming modules under the influence of factors that determine the necessary changes to the output module of the business process. A diagram of the impact of modular changes in business processes on the development of the seaport is shown in Figure 3.

Tracking the impact of modular changes on the development of the port is supposed to be carried out through a system of indicators that determines changes in the boundaries - inputs to outputs of the main business processes. The need for modular changes is indicated by numerous and diverse factors that lead to the emergence of new requirements for the conditions for the flow of the main business processes of the port, which in turn become the task of developing infrastructure, resources, the technological and organizational platform for managing business processes.

Table 1

Modular description of the output of the main business process (M4)

Module

Borders

Factors

The cargo is cleared. The container is empty (like a container during deconsolidation). The car is empty / with other cargo. Empty fitting platform / loaded with other cargo. The vessel is empty/ partly empty. Documents for cargo with marks of customs, and port administration.

Indicators: volumes of unloaded cargo from the vessel per unit of time; the volume of cargo after customs clearance in import, volume of cargo after customs clearance in export, and the number of berths.

Cargo in a warehouse/container yard. Formed container with cargo (during deconsolidation and consolidation). Warehouse documentation.

Availability, sufficiency, and efficiency of port equipment for handling container cargo.

Indicators: volume of cargo after customs clearance in import, the volume of cargo after customs clearance in export; the total area of warehouse complexes.

The container with the cargo is loaded, fixed on the vehicle. Documents for cargo with marks of customs, port administration, stevedoring company.

Establishment of trade and economic relations. Availability, sufficiency, efficiency of port equipment, including for the export of containers. Client orientation of internal port services. Seasonality of SP operation.

Indicators: volume of loaded container cargo per vessel per unit of time; the number of ship calls per year; the number of units of loading and unloading equipment by type (cranes, loaders, etc.); the number of berths; the number of applications per day for the passage of a vehicle with cargo to the port; the number of vehicles passing through the SP gate per unit of time; the volume of incoming cargo flow delivered by sea to the port as import cargo; the number of trains with cargo; average cycle time of loading and unloading operations; the total area of warehouse complexes; equipment performance; the number of permits for the export of cargo from the port Authority; the number of cases of damage to cargo in the port due to the fault of the personnel, leading to insured events, for which complaints were received; the number of personnel of the SP (subdivisions of the SP).

These factors include factors that determine the conditions for the use and change of incoming resources (availability, cost, and availability of all types of resources); factors of change in control resources (the level of state regulation of the industry, which puts forward requirements for the organization of business processes; the level of competition; globalization: capacity, needs, and volumes of the maritime transport market; trends in the development of transport in Azerbaijan; factors of change in tools (the level of development of the internal port communications system, the quality of the internal environment, etc.); factors that determine the requirements for changes in the product (orientation towards the development of the international maritime transport market, the development of modern technologies and equipment; the degree of innovativeness of the equipment and technology of the seaport; customer focus, etc.).

Figure 3. *Scheme of the impact of modular business process changes for the development of the seaport*

The current condition of the MBP

The future condition of the MBP

Modular changes

Change of borders of MBP

Influence of factors

Change of indicators of MBP

Indicators of the actual condition of the seaport

Indicators of seaport development

Conclusion. The scheme given in the article allows seeing the direction of the impact of modular changes on the indicators of the seaport in the implementation of certain areas of development of the port associated with changes in infrastructure, resources, internal environment, and internal port communications, as well as areas of development of the port as a subject of the external environment - the maritime transportation market. Thus, by implementing modular changes in the business processes of the port, it is possible to achieve the goals of its development, and obtain the desired increase in volume indicators, as well as direct and secondary effects. By managing processes and making modular changes in the composition of business processes, the seaport improves performance and increases the speed of achieving development targets.

METHODOLOGICAL ASPECTS OF MANAGEMENT ACCOUNTING IN CONSTRUCTION

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During the formation of the system of regulatory accounting regulation, its standardization, which take place in the conditions of the development of market relations, it is especially important and relevant to understand the essence of management accounting and its applicability in the construction industry of the Kyrgyz Republic.

By other words, management accounting generates information necessary to solve both internal and external problems that arise in the course of managing an organization. Some experts consider management accounting as a subsystem of accounting, while others consider it as a system for managing an organization. But at the same time, many agree that the main purpose of management accounting is the formation of information necessary for decision-making at different levels of organization management. An analysis of situation associated with the creation of the methodological foundations of management accounting gives grounds to assert that this problem must be approached conceptually. This is due to the fact that management accounting is inherently subjective, confidential; in addition, it is he who bears the main burden of providing information management for making informed and timely management decisions.

Features of construction activities largely determine the organizational structure of the accounting system, the methods and methods of accounting used, the possibility of using information technology.

Thus, despite the fact that Western system of management accounting is a much more extensive system than just accounting (the system for managing the final indicators of the main activity of an enterprise), the organization and creation of a management accounting system in Kyrgyz Republic should be viewed through the prism, first of all, of the accounting system, since how exactly the main information used in management accounting (on costs and results) is created here. The main advantage of management accounting is its flexibility and versatility.

Let us note once again that the state, when developing accounting rules, was not very concerned with the problem of adapting accounting principles to the specific needs of specific enterprises, but took a certain “medium-sized enterprise” and shifted the accounting principles that could potentially work on it to all the others.

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Geographical sciences

NATURAL CONDITIONS OF URBANIZED AREAS OF CENTRAL KAZAKHSTAN AS FACTOR OF TOURISM DEVELOPMENT

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ПРИРОДНЫЕ УСЛОВИЯ УРБАНИЗИРОВАННЫХ ТЕРРИТОРИЙ ЦЕНТРАЛЬНОГО КАЗАХСТАНА КАК ФАКТОР РАЗВИТИЯ ТУРИЗМА

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Abstract

The natural conditions of cities are the main factors in the development of tourism in Central Kazakhstan. Cities such as Kokshetau are attracted by their uniqueness, beauty and rich history. Despite the aridity of the climate, the scarcity of the hydrographic network and vegetation cover, there are oases created by nature that are not involved in technogenic processes.

Аннотация

Природные условия городов являются основными факторами развития туризма в Центральном Казахстане. Такие города, как Кокшетау, привлекают своей неповторимостью, красотой и богатой историей. Несмотря на аридность климата, скудность гидрографической сети и растительного покрова, здесь имеются оазисы, созданные природой, не втянутые в техногенные процессы.

Keywords: Central Kazakhstan, Kokshetau, climate, Kylshakty riever, Chaglinka riever, relief, hummocky.

Ключевые слова*:* Центральный Казахстан, Кокшетау, климат, р. Кылшакты, р. Чаглинка, рельеф, мелкосопочник.

Город Кокшетау расположен на побережье озера Копа в северной части Кокшетауской возвышенности, является центром Акмолинской области. Он находится на расстоянии 200 километров от столицы Казахстана – г. Астаны. В окрестностях города расположены многочисленные сопки. К окрестностям Кокшетау относятся посёлок Станционный и Красноярский сельский округ, состоящий из двух сельских населённых пунктов. Город был основан в 1824 году как военное оборонительное укрепление и станица Кокчетав. В 1868 году был преобразован в уездный город. После создания весной 1944 года Кокчетавской области город стал областным центром. С 1999 г. - областной центр Акмолинской области.

Климатические условия. Климат города резко континентальный, с засушливым жарким летом (+40ºС) и холодной малоснежной зимой (-45ºС) . По данным многолетних наблюдений Кокшетауской метеостанции число снеговых дней в году − около 150. Наибольшее количество осадков приходится на летние месяцы − 80%, и имеют ливневый характер. Глубина снежного покрова 0,5-1,5 м. Среднеиюльская температура +19,6º, среднеянварская температура -16,2º. Тёплый сезон года с температурами выше +10°С длится в среднем 137 дней (с 6 мая по 21 сентября). Глубина промерзания почвы нормативная − 1,85 м, максимальная − 2,6 м. На территории города преобладают ветры юго-западного

направления, с ноября по март они являются господствующими. К летним месяцам увеличивается повторяемость ветров западных, северо-западных и северных направлений, а в июле устанавливается равновесие, когда повторяемость ветров по всем направлениям примерно одинакова. [1]

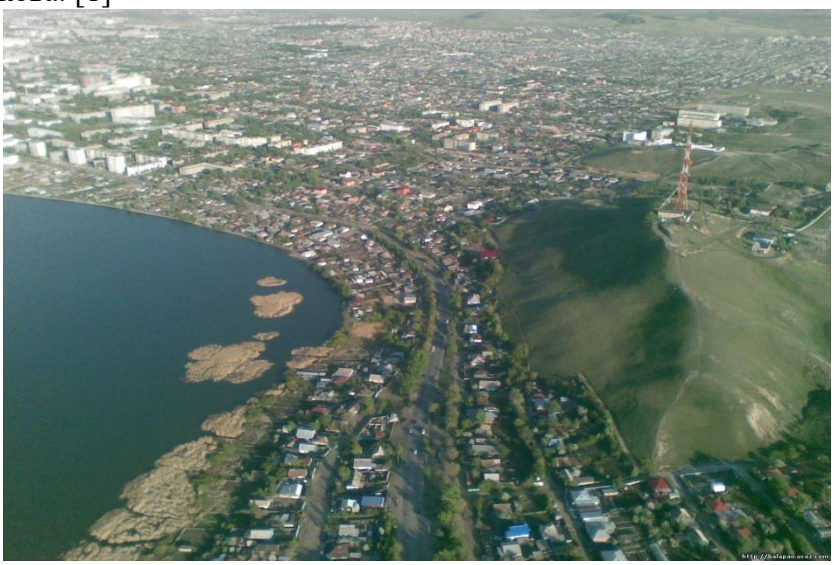

Рис. 1. Город Кокшетау. [5]

Геологическое строение и рельеф. В геологическом строении территории города принимают участие четвертичные отложения. Коренные метаморфические породы (глины, сланцы) и образования боровикской серии (сланцы, кварцы) выходят на дневную поверхность в южной и юго-западной части. Карбон представлен светло-серыми песчаниками, реже известняками. Палеоген - светло-серыми отложениями с прослойками глинных песков. Неогеновые красноцветные глины встречаются отдельными останцами. Долинные части озёрных понижений представлены палеогеновыми и неогеновыми отложениями (глины с прослоями глиняных песков, разноцветные глины).

Равнинные пространства г. Кокшетау сложены покровами нижнечетвертичного, четвертичного и современного возраста (суглинки, разнозернистые пески). Четвертичные отложения представлены аллювиальными, озёрно-аллювиальными и делювиальными отложениями.

В геоморфологическом отношении территория Кокшетау представлена плоской, местами холмисто-увалистой равниной, на юге и юго-западе – примыкающий к ним склон Кокшетауского мелкосопочника. Равнинная часть состоит из аллювиальных отложений − пески, глины и галечники с прослоями супесей и суглинков. Мелкосопочники сложены глинами и песками. Абсолютные отметки в пределах города колеблются от 254 до 274 м на равнине, и от 357 до 405 м на мелкосопочнике. В пределах мелкосопочника отмечается незначительное развитие оврагов, образованные в результате размыва верхнечетвертичных и современных озёрных отложений. Южная часть города с прилегающей к ней территорией состоит из холмисто-увалистого рельефа с превышением абсолютных отметок на 10-30 м.

Рельеф г. Кокшетау имеет унаследованный характер. Древние элементы поверхности в значительной степени определили морфологию современного рельефа. Эти формы рельефа, в частности котловины и долины, к настоящему времени заполнены рыхлыми отложениями третичного и четвертичного возраста. В пределах исследуемой территории выделяются следующие типы рельефа:

1. Эрозионно-денудационный рельеф:
- пологохолмистый мелкосопочник;
- грядовохолмистый мелкосопочник;
2. Аккумулятивный рельеф:
- пологохолмистая, расчлененная равнина;
3. Эрозионно-аккумулятивный рельеф:

- ложе озерных котловин;
- речные долины.

К эрозионно-денудационному рельефу относятся водораздельные участки пологохолмистого мелкосопочника и приречный мелкосопочник. Такое разнообразие типов и форм рельефа обусловлено, прежде всего, сложностью геологического и тектонического строения и различной степенью выветриваемости слагающих пород кристаллического фундамента. Абсолютные отметки сопок 254-405 м, относительные превышения - 65-70 м. Мелкосопочные понижения имеют характер хорошо выраженных долин, преимущественно северо-восточного направления. Молодые породы, залегающие к северу от мелкосопочника, образуют наклонную равнину с всхолмлённым рельефом. [2]

Аккумулятивный рельеф включает пологохолмистые слаборасчлененные равнины мелкосопочника и простирается на север и северо-восток города Кокшетау. Поверхность данного рельефа слабохолмистая, сложена продуктами разрушения горных пород в южной части (щебнистые образования) и глинами коры выветривания.

Эрозионно-аккумулятивный рельеф представлен речными долинами, их склонами и озёрными котловинами. Речные долины в пределах описываемого района представлены долинами рек Чаглинка и Кылшакты.

Речные долины. Вдоль западной границы города с юга на север протекает река Чаглинка, впадающая в озеро Копа. Долина довольно хорошо разработана. Здесь выделяются низкая и высокая поймы, первая и вторая надпойменные террасы. Низкая и высокая поймы, прослеживаются на всем протяжении реки. Высота пойменных террас колеблется от 0,5 до 1,5 м. Ширина достигает 300 м. Поверхность пойменных террас неровная (во время паводков). Русловые и пойменные отложения представлены песчаными образованиями. В пределах каменистых берегов они представлены равнинными отложениями.

Первая надпойменная терраса прослеживается почти на всем протяжении реки в виде узких полос шириной от 1 м до 150-200 м, высотой 2-3 м. К востоку от поселка Красный Яр весь участок между старым и современным руслами р.Чаглинки соответствует уровню первой надпойменной террасы. Ширина её здесь достигает 1,5 км. Поверхность террасы в основном ровная со слабым уклоном в сторону реки.

Рис. 2. Сопка Букпа на западной стороне г. Кокшетау. [6]

Вторая надпойменная терраса представлена также в виде узких полос шириной до 400 м. Она встречается и на правом, и на левом берегах реки. В районе пос. Красный Яр эта терраса имеет большую ширину (около 1 м). Речные отложения представлены разнозернистыми песками с прослоями глинистых песков, суглинками. Высота террасы 5-7 м, поверхность ровная, со слабыми (2-3 м) уклонами в сторону русла.

Река Кылшакты протекает по обширной равнине в субширотном направлении с востока на запад и впадает в оз. Копа с восточной стороны г. Кокшетау. Долина реки разработана слабо, имеет лишь низкую и высокую пойму и слабо выраженную первую надпойменную террасу. Ширина русла 5-7 м, на плесах до 10-20 м. Низкая и высокая пойма развиты на всём протяжении реки. Поверхность их неровная, высота около 1 м, ширина колеблется от 1 до 800 м в низовьях. Первая надпойменная терраса довольно чётко выделяется в районе Кокшетауского железнодорожного вокзала вверх по течению. Ширина террасы достигает 150-200 м высота 1,5-2 м. Террасовые отложения представлены мелкозернистыми и разнозернистыми песками с глинистыми прослойками. Аллювиальные отложения протягиваются в виде узкой полосы шириной 0,5-2 км по левому и правому берегу реки. Они представлены тонко- и мелкозернистыми песками, суглинками мощностью до 10-15 м, залегающими на неоген-четвертичных глинах. [3]

Рис. 3. Река Кылшакты. [6]

Озёра. В северо-западной части города Кокшетау расположено озеро Копа. С юго-запада к озеру подходят пологие холмы с относительной высотой 50-70 м. Длина озера − 5-5,5 км.; ширина озера − 3-3,5 км.; площадь зеркала озера − 12-14 км^2.; средняя глубина озера − 1,5-2,5 м.; объем воды − 20-48 млн. м^3. Водная поверхность озера в основном открытая; вдоль западного и северного берегов (ширина от 0,5 до 1 км.) имеются заросли тростника, вдоль южного и восточного берегов простирается песчано-галечная отмель, северо-западный берег низкий и пологий. В пределах котловины озера развит комплекс озёрно-аллювиальных и делювиально-пролювиальных отложений. Отложения представлены разнозернистыми песками с прослоями, гальки, щебня и глин мощностью 5-17 м. Подстилаются они глинисто-щебнистыми образованиями мезозойской коры выветривания.

В озеро впадают реки Чаглинка и Кылшакты. Река Чаглинка вновь вытекает из северной части озера. Основное русло реки в прошлом было расположено западнее современного и проходило мимо озера. Поэтому часть воды из реки попадала в озеро лишь в многоводные годы. В связи с обмелением озера в начале XX в. был сооружен канал, соединяющий р. Чаглинку с озером, который впоследствии стал основным руслом реки. Озеро регулирует сток р. Чаглинки в её нижнем течении. В маловодные годы стока из озера не происходит, и вся вода реки идет на его пополнение; в многоводные и средние по водности годы излишки воды сбрасываются в нижнюю Чаглинку. Годовая амплитуда колебаний уровня озера около 0,5-1 м., многолетняя – до 2,1 м. Водоём, который создает микроклимат и уникальную красоту в городе, одновременно является источником полива дачных участков, расположенных на западном берегу озера, используется как источник воды на технологические цели районных котельных, управления железной дороги и предприятий Северной промышленной зоны.

Рис. 4. Озеро Копа. [5]

Почвенно-растительный покров. Территория г. Кокшетау интенсивно освоена и относится к культурному ландшафту. Естественный облик почвенно-растительного покрова можно характеризовать только на отдельных, сохранившихся участках территории города и в ближайшей окрестности.

Чернозёмы обыкновенные среднемощные на территории земель г. Кокшетау получили своё развитие на выровненных участках слабохолмистых и слабонаклоненных равнин. Почвообразующие породы − жёлто-бурые глины. Мощность гумусовых горизонтов в среднем составляет 47 см. Гумуса в их верхнем горизонте содержится 6-9%. Чернозёмы обыкновенные − лучшие плодородные почвы.

Чернозёмы обыкновенные солонцеватые маломощные не получили широкого распространения, выделены в комплексе с солонцами. Солонцеватые чернозёмы отличаются неблагоприятными физическими свойствами, набухают во влажном состоянии и сильно уплотняются в сухом состоянии.

Лугово-чернозёмные среднемощные и маломощные почвы выделены в комплексе с зональными чернозёмами и солонцами. Почвы приурочены к понижениям и пониженным равнинам. По количеству гумуса солонцы не намного уступают чернозёмам, среди которых они находятся. Довольно значительны в них также запасы азота, фосфора и калия. Особенность минерального состава определяет их большую потребность в органических удобрениях и придаёт им такие физические свойства, как липкость и набухаемость.

Пойменные луговые почвы. Наиболее общей и существенной чертой пойменных почв является протекание процессов почвообразования под влиянием периодического затопления паводковыми водами. Пойменные почвы отличаются исключительным многообразием морфологических признаков и физико-химических показателей.

Лугово-болотные, болотные, луговые почвы и солончаки здесь встречаются редко. Из-за каменистости и условий рельефа они в большинстве случаев не пригодны для посевов.

Древесная растительность города представлена сосной, березой, осиной и другими представителями лесостепной зоны. Из кустарниковых растений произрастают: черемуха, смородина, вишня, малина, шиповник. Животный мир богат и разнообразен. Здесь водятся − зайцы, лисы, косули, барсуки и др. Из птиц – куропатки, тетерева. Из грызунов − хомяки, сурки, суслики. В озере Копа водятся окунь, чебак, щука. [4]

Таким образом, современные природные условия создают все условия для развития туризма, как в городе, так и в целом по области. В районе Кокшетау расположено большое количество природоохранных территорий, заповедников и парковых зон. Одним из ярких примеров уникального комплекса является национальный природный парк «Кокшетау». Главной достопримечательностью Кокшетау является Государственный Национальный

Природный Парк «Бурабай» с озёрами среди живописных гор, покрытых густыми хвойными лесами. Мягкий горный климат, чистый воздух и наличие целебных грязей делают отдых здесь не только приятным, но и лечебным. Для привлечения туристов на берегах озера построены многочисленные отели, санатории и дома отдыха.

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Jurisprudence

THE ROLE OF SPECIALIZED LAWYERS IN THE PREVENTION OF CRIME IN THE FIELD OF ECONOMIC ACTIVITY

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ЭКОНОМИКАЛЫҚ ҚЫЗМЕТ САЛАСЫНДАҒЫ ҚЫЛМЫСТЫЛЫҚТЫҢ АЛДЫН АЛУДАҒЫ МАМАНДАНДЫРЫЛҒАН ҚҰҚЫҚТАНУШЫЛАРДЫҢ РОЛІ

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Аннотация

Тарих пен болашақты саралай келе, адамзат қоғамның даму үрдісінің өзектілігін мамандардың қатысуынсыз сезіне және де оның шешімі мен жоспарлау қажеттілігін түсіне де алмайды.

Қазіргі таңда елімізде заңгер мамандығы бойынша жұмыспен қамтылмағандар саны ерекше көп. Оның себеп-салдарларына жоғарғы оқу орындарының материалдық техникалық базасының заманауи тұрғыға сай болмауы, профессорлық оқытушы құрамының іс-тәжірибелік біліктілігінің төмендігі, практика базаларының аздығы, олардың арасындағы байланыстардың аздығын, жатқызуға болады. Ең бастысы мамандарды қоғамда туындап жатқан мәселелерді шешуге бағытталған мамандарды саласымен даярланбауында. Республикамызда сот билігін жүзеге асыратын судьялар өз міндеттемелерін кәмелетке толмағандарға, экономикалық қызмет саласына және әкімшілік істер жөніндіне қатысты өкілеттіліктерін асырғанымен, сотқа дейінгі тергеп тексеру барысындағы мамандардың дайындалмауы еліміздің өзекті мәселелерінің бірі болып қала бермек.

Қоғамда ақпараттық және байланыс саласындағы қылмыстардың белең алуына да сол ақпараттық технологияны жете меңгерген заңгерлердің жоқтығы әсер етуде. Осы кемшіліктерді мақсатты негізде қалпына келтіру үшін, ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағытымен дайындалған мамандандырылған құқықтанушыларды пайдаланылуын қамтамасыз ету және құқықтық реттеуге ерекше назар аударылады. Бұл шараларды жоғарғы оқу орындарындағы білім беру бағдарламаларын жаңадан жасау арқылы жүзеге асыруға болады. Дамыған және

қалыптасқан құқықтық мемлекеттерде меншіктің әртүрлі ұйымдық-құқықтық нысандарындағы жоғарғы оқу орындарында нысаналы мақсатта бағытымен жоғарыда аталған мамандар дайындалады. Қазақстан да ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағыттағы мамандандырылған құқықтанушы дайындауға құқықтық, білім беру және экономикалық жүйесінде де мүмкіндіктері бар.

Abstract

Differentiating history and the future, humanity cannot realize the relevance of the process of development of society without the participation of specialists and understand the need for its solution and planning.

Currently, there is a particularly large number of unemployed people in the country by the profession of a lawyer. Its reasons include the inconsistency of the material and technical base of higher educational institutions with the modern approach, the low practical qualifications of the teaching staff, the small number of practice bases, the smallness of connections between them. The main thing is not the training of specialists in industries aimed at solving problems that arise in society. Despite the fact that judges exercising judicial power in the republic carry out their obligations with respect to minors, the sphere of economic activity and administrative cases, the lack of training of specialists during pre-trial investigation remains one of the urgent problems of the country. The growth of crimes in the field of information and communication in society is also affected by the lack of lawyers who own these information technologies. To eliminate these shortcomings on a targeted basis, special attention is paid to legal regulation and ensuring the use of specialized lawyers trained in the areas of information technology, economic activity, minors and administrative cases. These measures can be implemented by developing new educational programs in higher education institutions. In developed and established legal states, the above-mentioned specialists are trained in universities of various organizational and legal forms of ownership with the target direction. Kazakhstan also has opportunities in the legal, educational and economic system to train a specialized lawyer in the field of information technology, economic activity, juvenile affairs and administration

Keywords: specialized legal adviser, judicial system, law enforcement agencies, prosecutor's office, advocacy, information technology, economics, juvenile and administrative offenses.

Кілттік сөздер: мамандандырылған заңтанушы, сот жүйесі, құқық қорғау органдары, прокуратура, адвокатура, ақпараттық технология, экономика, кәмелетке толмағандар мен әкімшілік құқық бұзушылық салалары.

Қазақстан Республикасының 6-қаңтар 2012 жылғы «ҚР ұлттық қауіпсіздігі туралы» заңының 5-бабына сай республикамыздың негізгі ұлттық мүдделерінің бірі ретінде қоғам мен азаматтардың әлеуметтік-экономикалық, инновациялық және зияткерлік дамуының қажеттіліктеріне сәйкес келетін білім берудің деңгейі мен сапасына және елдің ғылыми әлеуетіне қол жеткізу және қолдау болып танылады[1].

Стратегиялық жоспарлау және реформалауагенттігі Ұлттық статистикалық бюросының ақпаратынай сәйкес, жоғарғы оқу орындарындағы студенттердің жалпы саны 576 557. Олардың ішінде 306 799-ы қыздар немесе 53,2%-ы. 2021/2022 оқу жылында студенттердің саны өткен оқу жылымен салыстырғанда 4,6%-ға төмендеген. Аталған оқу жылында барлығы оқуға 152 789 адам қабылданып, 115 186-сы түрлі себептермен оқудан шығарылып, 153 627-сі бітірген. Студенттердің жалпы санының 83%-ы күндізгі бөлімде, 7,6%-ы қашықтықтан, 7,3%-ы сырттай және 2%-ы кешкі бөлімде оқиды. Мемлекеттік білім беру гранттарының есебінен 196 084 студент білім алуда, яғни бұл жалпы білім алушылардың 34%-ын құрайды, ақылы негізде 380 473 адам немесе 66%-ы оқиды.

Мемлекеттік тілде оқитын студенттердің үлесі 64,9%, орыс тілінде -29,6% және ағылшын тілінде 5,5%-н құраған. Бітірген білікті маман 153 627, бұл 2019/2020 оқу жылымен салыстырғанда 8%-ға (142435 адам) артты. Штаттағы профессорлық-оқутышылық құрамның саны - 36 307-і адам, соның ішінде қоса атқарушылықпен 6137 оқытушы жұмыс істейді. Жалпы профессорлық-оқытушылық құрамнан 8,1% қызметкерлердің ғылым докторы ғылыми дәрежесі барлар, ғылым

кандидаты 31,7%, профессор атағы -6,3% және доцент а- 14,7%. Магистр академиялық дәрежесі бар оқытушылардың саны 13067 адам немесе 36%, философия докторы (PhD) және бейін бойынша доктор- 3079 адам немесе 8,8%.

Құқықтанушылардың жаңа моделін даярлау мен қоғамдағы арнайы мамандарға деген сұранысты қамтамасыз ету, оны жүзеге асыруда «Мамандандырылған құқықтану» білім беру бағдарламасын дайындау бәсекеге қабілетті мамандарды дайындау мен олардың құқықтық мәдениетін дамыту сондай-ақ, мемлекеттік оның ішінде сот, құқық қорғау институттарының тұрақты жұмыс істеуі, олардың қызметінің тиімділігін арттыруға бағытталады. Мәліметтер бойынша арнайы мамандандырылған салада қызмет атқару еліміз үшін жаңалық емес.

ҚР Президентінің 21.04.2005ж. №1557 Жарлығымен бекітілген ҚР Экономикалық қылмысқа және сыбайлас жемқорлыққа қарсы күрес агенттігі (қаржы полициясы) туралы Ережеге сай сыбайлас жемқорлық, экономикалық, және қаржылық қылмыстар мен құқық бұзушылықтардың алдын алу, оларды анықтау, жолын кесу, ашу және тергеу Агенттіктің негізгі міндеттерінің бірі болып танылған [2].

Республикамызда кәмелетке толмаған тұлғаларғы қатысты мамандандырылған соттар құру - Балалардың құқықтарын, бостандықтары мен заңды мүдделерін қамтамасыз етуде сот-құқықтық реформаның маңызды бағыттарың бірі. "Қазақстандағы ювеналдық әділет" халықаралық пилоттық жобасы кәмелетке толмағандарға арналған сот жүйесін құрудағы алғашқы қадам болып табылды.

03.06.2005 жылы өткен судьялардың IV республикалық съезінде Н.Ә. Назарбаев елімізде кәмелетке толмағандардың істері жөніндегі мамандандырылған соттар құруды міндеттеді.

23.08.2007ж. Елбасының "Кәмелетке толмағандардың істері жөніндегі мамандандырылған ауданаралық соттарды құру туралы" № 385 Жарлығы қабылданып, ол эксперимент ретінде Астана және Алматы қалаларында мамандандырылған соттар құрылған болатын [3].

05.07.2008 жылғы шілдеде қабылданған №64-IV "Қазақстан Республикасының кейбір заңнамалық актілеріне кәмелетке толмағандардың істері жөніндегі мамандандырылған ауданаралық соттар мәселелері бойынша өзгерістер мен толықтырулар енгізу туралы" Қазақстан Республикасының Заңына сай, қылмыстық, азаматтық және әкімшілік істердің соттылық санаттарын айқындады [4].

Алайда, жоғарғы оқу орындары аталған салаларда мамандарды дайындап жатқан жоқ. Еліміздің білім беру жүйесіндегі бұл мәселелерді қоғам субъектілері дербес шешуі мүмкін емес.

Ақпараттық технология, экономикалық қызмет, кәмелетке толмағандар және әкімшілік істер салаларындағы бағытта «Мамандандырылған құқықтану» білім беру, Дуальді оқыту бағдарларысыз, қоғам субъектілерінің ортақ жасалған жоспарынсыз және шетел мемлекеттерінің тәжірбиесінсіз заңгерлердің заманауи жаңа тұлғасын дайындау мүмкін емес.

Мамандандырылған құқықтанушылардың әлемдік аренада статусы ерекше. Қоғамдық қарым-қатынастарда туындап жатқан өзекті құқықтық мәселелердің оң шешімін табуда оразан зор роль атқарады.

Адам мен азамматтардың, заңды тұлғалардың конституциялық құқықтарын қорғау мәселелері мамандандырылған құқықтанушыларды даярлаумен шешілуі тиіс, дегенмен оны даярлаудағы қоғам субъектілерінің атқарылатын ортақ, тиімді іс-шараларын талап етеді.

Шетел мемлекеттеріндегі тәжірибелерді талдай кетсек.

2011жылы қараша айында *Франция* қаласының Бас прокурорының орынбасары Оңтүстік Қазақстан мемлекеттік университетінде жасаған баяндамасында, кәмелетке толмағандар ісі бойынша құқық қорғау органдарында қызмет атқару үшін, аталған салада кемінде он жыл еңбек өтілімі болуы керектігін атап өткен.

Нью-Йорктегі (АҚШ) Джон Джея атындағы Қылмыстық сот төрелгі колледжінде де кәмелетке толмағандарға қатысты мамандарды даярлау қарастырылған. Аталған сұрақтар мемлекеттік органдар жүйесі қызметіне оң әсер беретіндігін атап өту керек.

Егер, еліміздің білім беру жүйесінің ахуалын ескерер болсақ, жоғарыда келтірілген шетел тәжірибелері, мамандандырылған құқықтанушыларды даярлаудағы шараларды ұйымдастырудың тиімді жолдарын қарастыруға бағытталған, негізделген ілімдер мен практикалық дағдылардың үйлесімді жүйесін құруға, олардың құқықтық реттеу базаларының қалыптасуына ықпал етеді.

Мамандандырылған құқықтанушыларды заманауи талаптарына сәйкес қоғам субъектілерінің даярлауы және олардың қызметтерінің құқықтық үйлестірілуі, құқықтық мемлекет құруда оң әсерін береді. Оларды даярлаудағы әртараптандыру, білім беру жүйесінің жағдайын нақты жақсартуға мүмкіндік береді.

Мамандандырылған құқықтанушыларды даярлау сот жүйесіндегі, құқық қорғау органдары мен құқықтың кез-келген салаларында тұлғалардың мүдделерін қорғай алатын бәсекеге қабілетті, білікті заңгерлердің қатарын толтыра алады.

Білім саласындағы мәселе ең күрделі, маңызды, қоғамдық қатынастардың әртүрлі салаларын біріктіретін ошақтың қайнар көзі екенін жоққа шығара алмаймыз.

Бұл бағыттағы әрі қарайғы зерттеулердің маңыздылығы, ұсынылып отырған жобаның соңғы білім беру саласындағы реформаларына негізделген, жоғары оқу орындарының мамандандырылған заңгерлерді даярлау бойынша қызметінің құқықтық негіздерін қалыптастыру мәселесін зерттеуге байланысты, яғни білім беру және дуальды оқыту бағдарламаларының жобасын әзірлеу.

Сонымен қатар, мамандарды даярлау мерзімінде де ерекшеліктердің болатынын атап өтуге болады. Кеңес үкіметі кезеңінде заңгер және экономист мамандықтарын оқытуға 10 жыл берілген болса, қазіргі кезеңде бакалавр бірінші мамандығына 4 жыл және екінші жоғарғы біліміне 2 жыл, білім алушы жалпы 6 жыл уақытын бөлуге тиіс. Ал егер мамандандырылған заңтанушыларды сала саласымен дайындайтын болсақ бар жоғы 4 жыл уақыт кетеді екен.

Ең бастысы - қоғамда туындап жатқан мәселелерді шешуге бағытталған мамандарды саласымен даярланбауында. Республикамызда сот билігін жүзеге асыратын судьялар өз міндеттемелерін кәмелетке толмағандарға, экономикалық қызмет саласына және әкімшілік істер жөніндіне қатысты өкілеттіліктерін асырғанымен, сотқа дейінгі тергеп тексеру барысындағы аталған бағытта мамандардың дайындалмауы еліміздің өзекті мәселелерінің бірі болып қала бермек. Қоғамда ақпараттық және байланыс саласындағы қылмыстардың белең алуына да сол ақпараттық технологияны жете меңгерген заңгерлердің жоқтығы әсер етуде. Осы кемшіліктерді мақсатты негізде қалпына келтіру үшін, ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағытымен дайындалған мамандандырылған құқықтанушыларды пайдаланылуын қамтамасыз ету және құқықтық реттеуге ерекше назар аударылады. Бұл шараларды жоғарғы оқу орындарындағы білім беру бағдарламаларын жаңадан жасау арқылы жүзеге асыруға болады. Дамыған және қалыптасқан құқықтық мемлекеттерде меншіктің әртүрлі ұйымдық-құқықтық нысандарындағы жоғарғы оқу орындарында нысаналы мақсатта бағытымен жоғарыда аталған мамандар дайындалады. Қазақстан да ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағыттағы мамандандырылған заңгерлерді дайындауға құқықтық, білім беру және экономикалық жүйесінде де мүмкіндіктері бар. ҚР Қылмыстық кодексінде ақпараттандыру және байланыс саласындағы қылмыстық құқық бұзушылықтар қарастырылған. Сондай-ақ, еліміздің сот жүйесі экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша сот билігін жүзеге асыруда.

Ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағытта мамандарды дайындаудың маңыздылығын ескере отырып, зерттеу қорытындысы бойынша жоғары оқу орындарының қызметін құқықтық реттеу құралына айналатын «Мамандандырылған құқықтану» білім беру бағдарламасын дайындау заман талабы. Бұдан туындайтыны, жоғарғы оқу орындарында модульдік оқыту бағдарламаларының траекториялары аталған бағытта түзілгені абзал.

Құқықтық мемлекетті құрудағы қоғамдық қатынастарды реттеу барысында ҚР сот жүйесінде жаңа судьяларды даярлау сұрақтары қалыптасқан. Атап айтқанда,

мамандандырылған экономикалық, кәмелетке толмағандардың ісі мен әкімшілік құқық бұзушылықтар бойынша судьялардың сот билігінде болуы – адамдардың конституциялық құқықтарын қамтамасыз етудің кепілі. Экономикалық соттарды ашу туралы сұрақтары ҚР Президентінің 16.01.2001ж.№535 Жарлығынан бастау алған болатын. Дегенмен, бұл сот процесіндегі шешімін тауып жатқан мәселелер. Ал, сотқа дейінгі кезеңде ҚР Ішкі Істер Министрлігінде, құқық қорғау органдарында, оның ішінде прокуратура, адвокатура және жалпы жеке және заңды тұлғалардың қоғамдағы құқықтарын ақпараттық технология, экономика, кәмелетке толмағандар мен әкімшілік құқық бұзушылық салаларында арнайы мамандандырылған заңтанушылармен қамтамасыз ету сұрақтары қарастырылмаған. Заңгердің жаңа моделін даярлау мен қоғамдағы арнайы мамандарға деген сұранысты қамтамасыз ету, даудамайлардың заң шеңберінде шешіліп, ол бойынша соттардың заңды негізделген процесуалдық шешімдерін шығаруда орасан зор роль атқарады.

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МАМАНДАНДЫРЫЛҒАН ЗАҢТАНУШЫЛАРДЫ ДАЯРЛАУДЫҢ ҰЙЫМДАСТЫРУШЫЛЫҚ-ҚҰҚЫҚТЫҚ МӘСЕЛЕЛЕРІ

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Abstract

Differentiating history and the future, humanity cannot realize the relevance of the process of development of society without the participation of specialists and understand the need for its solution and planning.

Currently, there is a particularly large number of unemployed people in the country by the profession of a lawyer. Its reasons include the inconsistency of the material and technical base of higher educational institutions with the modern approach, the low practical qualifications of the teaching staff, the small number of practice bases, the smallness of connections between them. The main thing is not the training of specialists in industries aimed at solving problems that arise in society. Despite the fact that judges exercising judicial power in the republic carry out their obligations with respect to minors, the sphere of economic activity and administrative cases, the lack of training of specialists during pre-trial investigation remains one of the urgent problems of the country. The growth of crimes in the field of information and communication in society is also affected by the lack of lawyers who own these information technologies. To eliminate these shortcomings on a targeted basis, special attention is paid to legal regulation and ensuring the use of specialized lawyers trained in the areas of information technology, economic activity, minors and administrative cases. These measures can be implemented by developing new educational programs in higher education institutions. In developed and established legal states, the above-mentioned specialists are trained in universities of various organizational and legal forms of ownership with the target direction. Kazakhstan also has opportunities in the legal, educational and economic system to train a specialized lawyer in the field of information technology, economic activity, juvenile affairs and administration. Chapter 7 of the Criminal Procedure Code of the Republic of Kazakhstan provides for criminal offenses in the field of informatization and communications. Also, the judicial system of the country exercises judicial power in the field of economic activity, juvenile affairs and administrative cases.

Аннотация

Тарих пен болашақты саралай келе, адамзат қоғамның даму үрдісінің өзектілігін мамандардың қатысуынсыз сезіне және де оның шешімі мен жоспарлау қажеттілігін түсіне де алмайды.

Қазіргі таңда елімізде заңгер мамандығы бойынша жұмыспен қамтылмағандар саны ерекше көп. Оның себеп-салдарларына жоғарғы оқу орындарының материалдық техникалық базасының заманауи тұрғыға сай болмауы, профессорлық оқытушы құрамының іс-тәжірибелік біліктілігінің төмендігі, практика базаларының аздығы, олардың арасындағы байланыстардың аздығын, жатқызуға болады. Ең бастысы мамандарды қоғамда туындап жатқан мәселелерді шешуге бағытталған мамандарды саласымен даярланбауында. Республикамызда сот билігін жүзеге асыратын судьялар өз міндеттемелерін кәмелетке толмағандарға, экономикалық қызмет саласына және әкімшілік істер жөніндіне қатысты өкілеттіліктерін асырғанымен, сотқа дейінгі тергеп тексеру барысындағы мамандардың дайындалмауы еліміздің өзекті мәселелерінің бірі болып қала бермек. Қоғамда ақпараттық және байланыс саласындағы қылмыстардың белең алуына да сол ақпараттық технологияны жете меңгерген заңгерлердің жоқтығы әсер етуде. Осы кемшіліктерді мақсатты негізде қалпына келтіру үшін, ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағытымен дайындалған мамандандырылған құқықтанушыларды пайдаланылуын қамтамасыз ету және құқықтық реттеуге ерекше назар аударылады. Бұл шараларды жоғарғы оқу орындарындағы білім беру бағдарламаларын жаңадан жасау арқылы жүзеге асыруға болады. Дамыған және қалыптасқан құқықтық мемлекеттерде меншіктің әртүрлі ұйымдық-құқықтық нысандарындағы жоғарғы оқу орындарында нысаналы мақсатта бағытымен жоғарыда аталған мамандар дайындалады. Қазақстан да ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағыттағы мамандандырылған құқықтанушы дайындауға құқықтық, білім беру және экономикалық жүйесінде де мүмкіндіктері бар. Қазақстан Республикасы Қылмыстық процестік кодексінің 7-тарауында ақпараттандыру және байланыс саласындағы қылмыстық құқық бұзушылықтар қарастырылған. Сондай-ақ, еліміздің сот жүйесі экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша сот билігін жүзеге асыруда.

Keywords: specialized legal adviser, judicial system, law enforcement agencies, prosecutor's office, advocacy, information technology, economics, juvenile and administrative offenses.

Кілттік сөздер: мамандандырылған заңтанушы, сот жүйесі, құқық қорғау органдары, прокуратура, адвокатура, ақпараттық технология, экономика, кәмелетке толмағандар мен әкімшілік құқық бұзушылық салалары.

Білім беру жүйесі – күрделі бірақ, өз негізінде мемлекеттік қызметтің бірегей саласы. Жоғарғы білім беру мемлекеттік, ұлттық университеттермен қатар жеке меншік жоғарғы оқу орындарымен де жүзеге асырылады. Бірақ, қоғамда тұлғаларының мүдделерін кәсіби деңгейде, еліміздің заңнамаларында көрсетілген талаптарға сай қорғау сұрақтары әлі күнге дейін жауабын толық таппаған мәселелер ретінде қала бермек. Бұл, жоғарғы оқу орындарында мамандар қылмыстық және азаматтық бағытта дайындаудан, сонымен қатар ол мамандардың сотқа дейінгі кезеңде де осы талаптармен өз құзіреттілігін асырудан туындайды. Алайда, сот жүйесі өздерінің қызметтерін мамандандырылған, яғни экономикалық қызмет, кәмелетке толмағандардың және әкімшілік құқықық бұзушылық істер салаларына байланысты қалыптастырады.

Сондықтан, жеке саладағы институт болып табылатын білім беру жүйесі, аталған үш бағытта мамандар даярламағандықтан өзінің дербестігі, спецификалық белгілері бар басқа да сала институттарымен байланыста бола отырып, соттарда тұлғалардың мүдделері толыққанды қорғай алмайды.

Тарих пен болашақты саралай келе, адамзат қоғамның даму үрдісінің өзектілігін мамандардың қатысуынсыз сезіне және де оның шешімі мен жоспарлау қажеттілігін түсіне де алмайды. Мамандардың біліктіліктерін арттыру, қоғам талаптарына сай келуінің үлгісі ғылыммен толықтылырлып отыратынына күмән жоқ. Ұлы Абай өзінің оныншы қара сөзінде ғылымның өмірде алар орны туралы кеңінен тоқталып кеткен [1]. Заманауи мамандардың жаңа моделі туралы ғылым нені ұсынады? Қоғамдық қатынастарды реттеу мәселелерінде өзекті бола ала ма, оны дер кезінде шеше ала ма, жалпы оны шешуге қауһары бар ма? Зерделеп көрелік.

Жалпы заңтанушы (юриспруденция француз тілінен аударғанда) – мемлекеттің қызметін құқықтық ұйымдастырудың ерекше жүйесі түріндегі заңдылықты зерделейтін ғылым [2]. Қазіргі таңда елімізде заңгер мамандығы бойынша жұмыспен қамтылмағандар саны ерекше көп. Оның себеп-салдарларына жоғарғы оқу орындарының материалдық техникалық базасының заманауи тұрғыға сай болмауы, профессорлық оқытушы құрамының іс-тәжірибелік біліктілігінің төмендігі, практика базаларының аздығы, олардың арасындағы байланыстардың төмендеңгейде болуын жатқызуға болады. Сондай-ақ, бәсекеге қабілеттілік деңгейі төмен, коммерциялық компаниялардың мүдделерін қорғай алмауы, жеке меншік нарық экономикасында тиімсіз, ескірген пәндердің оқытылуы да жұмыссыздық себептерінің бір белгілерінен. Республикамыздың тұңғыш президенті 14.12.2014 жылғы халыққа жолдауында ескірген немесе сұранысы жоқ ғылым және білім пәндерінен арылу жайлы тоқталған болатын [3]. АҚШ білім жүйесінде студент Мемлекет және құқық теориясы, олардың тарихына қатысты факультативті теориялық-тарихи пәндерді өтпестен заңгер білімін алады[4]. Бізде жоғарғы оқу орындарында әліде Кеңес одағынан қалған ескі Мемлекет және құқық теориясы, Мемлекет және құқық тарихы, Саяси ілімдер тарихы, Жалпы мемлекеттердің құқық тарихы пәндерін оқыту жүргізілуде. Заңгерлердің жаңа моделін даярлау үшін қажетті пәндердің тізімі №1-кестеде және мамандықтар саласының тізімі №2-кестеде ұсынылады.

Сонымен қатар, мамандарды даярлау мерзімінде де ерекшеліктердің болатынын атап өтуге болады. Кеңес үкіметі кезеңінде заңгер және экономист мамандықтарын оқытуға 10 жыл берілген болса, қазіргі кезеңде бакалавр бірінші мамандығына 4 жыл және екінші жоғарғы біліміне 2 жыл, білім алушы жалпы 6 жыл уақытын бөлуге тиіс. Ал егер мамандандырылған заңтанушыларды сала саласымен дайындайтын болсақ бар жоғы 4 жыл уақыт кетеді екен.

Ең бастысы - қоғамда туындап жатқан мәселелерді шешуге бағытталған мамандарды саласымен даярланбауында. Республикамызда сот билігін жүзеге асыратын судьялар өз міндеттемелерін кәмелетке толмағандарға, экономикалық қызмет саласына және әкімшілік істер жөніндіне қатысты өкілеттіліктерін асырғанымен, сотқа дейінгі тергеп тексеру барысындағы аталған бағытта мамандардың дайындалмауы еліміздің өзекті мәселелерінің бірі болып қала бермек. Қоғамда ақпараттық және байланыс саласындағы қылмыстардың белең алуына да сол ақпараттық технологияны жете меңгерген заңгерлердің жоқтығы әсер етуде. Осы кемшіліктерді мақсатты негізде қалпына келтіру үшін, ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағытымен дайындалған мамандандырылған құқықтанушыларды пайдаланылуын қамтамасыз ету және құқықтық реттеуге ерекше назар аударылады. Бұл шараларды жоғарғы оқу орындарындағы білім беру бағдарламаларын жаңадан жасау арқылы жүзеге асыруға болады. Дамыған және қалыптасқан құқықтық мемлекеттерде меншіктің әртүрлі ұйымдық-құқықтық нысандарындағы жоғарғы оқу орындарында нысаналы мақсатта бағытымен жоғарыда аталған мамандар дайындалады. Қазақстан да ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағыттағы мамандандырылған заңгерлерді дайындауға құқықтық, білім беру және экономикалық жүйесінде де мүмкіндіктері бар. ҚР Қылмыстық процестік кодексінің 7-тарауында ақпараттандыру және байланыс саласындағы қылмыстық құқық бұзушылықтар қарастырылған. Сондай-ақ, еліміздің сот жүйесі экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша сот билігін жүзеге асыруда.

Ақпараттық технология, экономикалық қызмет саласы, кәмелетке толмағандар және әкімшілік істер бойынша бағытта мамандарды дайындаудың маңыздылығын ескере отырып, зерттеу қорытындысы бойынша жоғары оқу орындарының қызметін құқықтық реттеу құралына

айналатын «Мамандандырылған заңтану» Білім беру бағдарламасын дайындау заман талабы. Бұдан туындайтыны, жоғарғы оқу орындарында модульдік оқыту бағдарламаларының траекториялары аталған бағытта түзілгені абзал.

Құқықтық мемлекетті құрудағы қоғамдық қатынастарды реттеу барысында ҚР сот жүйесінде жаңа судьяларды даярлау сұрақтары қалыптасқан. Атап айтқанда, мамандандырылған экономикалық, кәмелетке толмағандардың ісі мен әкімшілік құқық бұзушылықтар бойынша судьялардың сот билігінде болуы – адамдардың конституциялық құқықтарын қамтамасыз етудің кепілі. Экономикалық соттарды ашу туралы сұрақтары ҚР Президентінің 16.01.2001ж.№535 Жарлығынан бастау алған болатын. Дегенмен, бұл сот процесіндегі шешімін тауып жатқан мәселелер. Ал, сотқа дейінгі кезеңде ҚР Ішкі Істер Министрлігінде, құқық қорғау органдарында, оның ішінде прокуратура, адвокатура және жалпы жеке және заңды тұлғалардың қоғамдағы құқықтарын ақпараттық технология, экономика, кәмелетке толмағандар мен әкімшілік құқық бұзушылық салаларында арнайы мамандандырылған заңтанушылармен қамтамасыз ету сұрақтары қарастырылмаған. Заңгердің жаңа моделін даярлау мен қоғамдағы арнайы мамандарға деген сұранысты қамтамасыз ету, даудамайлардың заң шеңберінде шешіліп, ол бойынша соттардың заңды негізделген процесуалдық шешімдерін шығаруда орасан зор роль атқарады.

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Pedagogical sciences

DEVELOPMENT OF WRITING SKILLS AMONG STUDENTS OF NON-PHILOLOGICAL FACULTY IN THE CONDITIONS OF DIGITALIZATION

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Abstract
The article discusses the development of writing skills among students of the non-philological faculty in the context of digitalization in the educational space of the university.

Keywords: competencies, writing, non-philological faculties, digitalization, skills, teaching, written, speech, systematic, analyzing.

Students studying in higher educational institutions enter universities with a certain level of foreign language proficiency, that is, on the basis of the basic knowledge they received at school, academic lyceum or college. Therefore, the program of teaching a foreign language at a university should be created taking into account the previously acquired skills and competencies of applicants in speaking, reading, writing and translating in a foreign language in the context of digitalization of the educational space of the university.

When studying a foreign language, students of non-philological faculties should learn about the sound system and morphological structure of this language, compare them with the sound system and morphological structure of their native language and learn to identify their similarities and differences.

Students are required to know the structure of sentences, word order, lexical meanings of words, their correct pronunciation, correctly compose sentences and related texts in accordance with the requirements of the syntax of the foreign language being studied. The programs also provide for the formation of skills to express an opinion in their field, write an essay, translate texts, understand scientific terms, use scientific and technical literature in a foreign language. From this it can be seen that the standard program of the non-philological undergraduate course, compiled for the subject "Foreign Languages", has been improved to some extent. In it, students of non-philological faculties also pay attention to the development of writing skills.

In the process of teaching English to students of non-philological faculties, along with teaching linguistic phenomena and the development of oral speech, it is also envisaged to form in them a sense of responsibility for their profession, love and loyalty to the Motherland, glorification of national values and heritage, high morality and spiritual purity.

Oral communication is episodic, and written communication requires knowledge of specific lexical and grammatical material and spelling rules associated with writing that meet the requirements of a foreign language norm. Written speech requires completeness of thought on certain topics, unlike oral speech, it has its own way of expressing thoughts. It is impossible to change the written text addressed to the reader, it can be reread, but its content does not change. The writer does not repeat twice what is written, so the reader of the written message receives the information as it is. And the speaker, based on the situation, can change his statements or repeat them twice in a different tone, changing intonation. In oral speech, you can often find a hitch, a pause, a return to the topic and some introductory words (a-a-a, kegin in Uzbek; so, so, hm, a-a-a in Russian; so, well, gm, etc. in English).

The written text is informative and concise. For example, when we compare oral and written forms of speech, we see that in the written construction each action is described in detail, in contrast to the oral one. In addition, the squeaker cannot immediately enter into feedback with the addressee,

as in oral speech. According to the lexical and grammatical structure, written speech is more perfect than oral speech, since written speech can be revised and corrected many times. In oral speech, this is impossible, it is spontaneous. We see a sharp difference between oral and written speech in terms of execution speed. In this case, writing requires much more time. When following the language standard, written speech is subject to more serious requirements than oral speech. Due to the fact that oral speech is dialectal in nature, there are many cases of deviation from the linguistic norm. Written text has its own rules. It is also worth noting that the formation of written communication skills requires more effort and time than oral communication. But, since oral speech is primary in relation to written speech, the use of oral speech in the development of written speech is effective. All these factors mentioned above determine a special approach to the development of writing skills among students of non-philological faculties. This requires the trainees to have a certain level of oral and written speech skills in a foreign language in order to study scientific and technical literature related to their profession, the ability to obtain written information from foreign sources. This determines the desire of the future specialist to master certain vocabulary related to foreign cultural and economic relations, and the ability to search for the information he needs from foreign sources.

Teaching a foreign language at non-philological faculties is not a systematic study of a language, but teaching it from the point of view of the future specialization of students, which requires the selection of language material based on the specialization of teaching a foreign language. To this end, it is required to determine the sequence of studying the selected educational material, and to find out what auxiliary educational tools and methods can be effective in studying this material. Therefore, teaching writing in English implies the formation of lexical and grammatical writing skills necessary for students to master the terms related to their future profession, and writing and speech skills to express their thoughts in English.

To analyze this more deeply, it is necessary to determine when and in what situations people are more engaged in writing. Analyzing the ultimate goal of writing, you can see that people usually use writing, or rather, written speech, in the following situations:

1. In filling out the questionnaire;
2. In writing personal and official letters and a written response to them;
3. In writing a resume or autobiography;
4. In writing applications for various purposes;
5. In writing annotations, lectures, essays, greeting cards and other occasions.

In these listed cases, attention is focused on the content of the written text, and not on the spelling of a letter, a combination of letters, or a word. Usually, in such cases, the writer can ignore the calligraphic and spelling description of the text, paying attention mainly to the content of the text and its design from a lexico-grammatical point of view.

The study and analysis of the current state of teaching written speech in many ways helps to reorganize the teaching of written speech and develop new, more effective ways of forming and developing writing skills. At the present time, based on modern requirements, every specialist must know the intercultural identity necessary in the process of communication in a foreign language, including laws, customs, cultural traditions of different societies and the mentality of the people of the countries of the studied foreign language.

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CRITERIA AND INDICATORS FOR DIAGNOSING THE DEVELOPMENT OF OFFICERS' PROFESSIONAL INTEGRITY

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КРИТЕРІЇ ТА ПОКАЗНИКИ ДІАГНОСТУВАННЯ РОЗВИНЕНОСТІ ПРОФЕСІЙНОЇ ДОБРОЧЕСНОСТІ ОФІЦЕРІВ

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Професійна доброчесність офіцера є досить складною інтегрованою професійно важливою етичною якістю, яка, з одного боку, охоплює його загальну військово-професійну культуру як офіцера, в якій актуалізується внутрішня культура як професіонала та духовна культура як представника МО та ЗС України, а з іншого – має поведінково-діяльнісний і контекстний характер прояву щодо норм, цінностей, правил, культури військово-професійної діяльності, етичної та правової відповідальності за результати та наслідки власних фінансово-матеріальних рішень.

У процесі виокремлення конкретних критеріїв діагностування її сформованості та розвиненості слід мати на увазі такі теоретичні положення:

професійна доброчесність – це сукупність етичних принципів і правил поведінки офіцера (-ів) як суб'єкта (-ів) розпорядження певними фінансово-матеріальними та іншими ресурсами згідно зі відповідними етичними та правовими нормами в ЗС України;

це сукупність принципів і правил, визначених законом, якими мають керуватись офіцер (-и) як суб'єкт (-и) розпорядження певними фінансово-матеріальними та іншими ресурсами в процесі реалізації своїх посадових компетенцій у різних ланках військового управління.

Вона передбачає вірність офіцера таким головним цінностям: справедливості, офіцерської чесності, довірі, мужності, справедливості, повазі до закону та відповідальності, професійній суб'єктності.

Вважаємо за необхідне виокремити чіткі критерії діагностування сформованості та розвиненості професійної доброчесності офіцерів на основі використання багаторівневого аналізу та узагальнення їх професійних компетенцій як суб'єктів військово-професійної діяльності. У процесі визначення критеріїв і показників необхідно дотримуватися, на нашу думку, таких чітких вимог: «об'єктивність, тобто відображення ознак, притаманних предмету, який досліджується, незалежно від свідомості та волі суб'єкта дослідження; відображення суттєвих ознак предмета діагностування; стійкість і постійність досліджуваних ознак; зв'язок із цілями, завданнями, функціями та змістом конкретного… дослідження; безпосередній зв'язок між метою і кінцевим результатом досліджуваного явища» [1, с. 117].

Вважаємо, кожен критерій – це певна ознака професійної доброчесності офіцера, яка дає можливість з'ясувати сформованість і розвиненості певних її аспектів. Критерії системно формують її «контур» та показники наповнюють конкретним змістом. На основі врахування цілей, завдань, змісту, специфіки, особливостей і результатів розпорядження офіцерами фінансово-матеріальними та іншими ресурсами, а також вимог сучасних методологічних підходів до розуміння змісту їх професійної доброчесності доцільно визначити мінімальну кількість **критеріїв діагностування її сформованості та розвиненості**, які можуть певним чином за кількістю змінюватися залежно від конкретної посади – оперативна чи стратегічна ланка управління, простий виконавець чи начальник певного структурного підрозділу розпорядження фінансово-матеріальними та іншими ресурсами, яку обіймає конкретний офіцер.

Ціннісно-мотиваційний критерій є вкрай необхідним для діагностування професійної доброчесності офіцера, оскільки «…цінності… формують найголовніше для кожної особи та фахівця – їх ставлення до світу, до речей, до діяльності, до інших людей і до самого себе» [2, с. 52], тобто вони формують їх ставлення до своїх посадових компетенцій і відповідно формують і насичують конкретним змістом мотивацію військово-професійної діяльності, а також ці цінності та мотивація складають підвалину професійної доброчесності та відповідно визначають смисл, мету і результат їх професійної діяльності в сфері розпорядження фінансово-матеріальними та іншими ресурсами. Цей критерій має дати можливість з'ясувати смислове наповнення цінностей і мотивації військово-професійної діяльності офіцера та усвідомлення ним її цінностей, настанов та їх сприйняття як етичної підвалини своєї доброчесної діяльності. Так, ціннісне позитивне ставлення до неї формує і розвиває їх внутрішню вмотивованість та стимулює суб'єктну поведінку в професійній діяльності, актуалізацію суб'єктного потенціалу в процесі розв'язання фінансово-матеріальних та інших проблем, а також потребу у розвитку організаційно-управлінських знань, розвитку та вдосконаленні раніше набутих організаційно-управлінських умінь і здатностей як суб'єкта військового управління.

Таким чином, система цінностей і мотивації військово-професійної діяльності кожного офіцера реалізує насамперед аксіологічну та регулятивну функції в реалізації ними розпорядчо-управлінської функції в сфері забезпечення фінансово-матеріальними та іншими ресурсами життєдіяльності військ та стимулює сумлінну реалізацію ними організаційно-управлінської функції як суб'єкта військового управління.

Зміст цього критерію складають такі *показники*: цінності організаційно-управлінської діяльності як суб'єкта військового управління; мотивація організаційно-управлінської діяльності як суб'єкта забезпечення фінансово-матеріальними та іншими ресурсами життєдіяльності військ. Це насамперед потреби, мотиви, мотивація та цінності відповідної діяльності в органах фінансово-матеріального та інших видів забезпечення життєдіяльності військ.

Когнітивний критерій діагностування професійної доброчесності офіцера як суб'єкта забезпечення фінансово-матеріальними та іншими ресурсами життєдіяльності військ дає можливість з'ясувати знання ним своєї організаційно-управлінської діяльності в органах фінансово-матеріального та інших видів забезпечення та, володіння певною сукупністю теоретичних і практичних військово-професійних, організаційно-управлінських і фінансово-матеріальних знань, що складають підвалину їх організаційно-управлінської діяльності й практичного – організаційно-управлінського – мислення як менеджера управління фінансово-матеріальними та іншими ресурсами життєдіяльності військ в різних ланках військового управління.

Виокремлюємо такі групи *показників*: організаційно-управлінські знання як суб'єкта військового управління в конкретній ланці військового управління; фахові знання як суб'єкта забезпечення фінансово-матеріальними та іншими ресурсами життєдіяльності військ; треті – нормативно правові знання, які регулюють його діяльність як суб'єкта забезпечення фінансово-матеріальними та іншими ресурсами життєдіяльності військ. Вважаємо, що без перших знань другі знання втрачають контекстність та адресність, а треті – надають їй чіткого правового регулювання. Військово-професійні знання необхідні кожному з них для реалізації своєї організаційно-управлінської функції на різних ланках військового управління з урахуванням їх специфіки та особливостей.

Поведінково-діяльнісний критерій дає можливість з'ясувати їх практичну здатність використовувати військово-професійні та організаційно-управлінські знання при вирішенні ними завдань у системі забезпечення фінансово-матеріальними та іншими ресурсами життєдіяльності військ, що дозволяє з'ясувати практичну їх здатність успішно застосовувати набуті військово-професійні та фахові знання у процесі реалізації своїх посадових компетенцій як суб'єкта фінансового-матеріального та інших видів забезпечення.

Показники такі: організаційні вміння та навички успішно вирішувати практичні організаційні завдання щодо забезпечення фінансово-матеріальними та іншими ресурсами життєдіяльності військ на різних ланках військового управління; організаційні вміння щодо оцінювання фінансово-матеріальної обстановки, приймати оптимальні рішення і домагатися їх реалізації; організаторські навички та вміння щодо діяльності як суб'єкта фінансово-матеріального та інших видів забезпечення життєдіяльності військ на різних ланках військового управління в стандартних і екстремальних ситуаціях та умовах діяльності; вміння організовувати як власну службову діяльність, так і підлеглих згідно зі вимогами нормативно-правових документів.

Суб'єктний критерій оцінювання військово-професійної та фахової діяльності суб'єктів фінансово-матеріального та інших видів забезпечення є вкрай необхідним, оскільки він є інтегрованим її проявом, оскільки дає з'ясувати професійно важливі прояви професійної доброчесності – справедливості, офіцерської чесності, довірі, мужності, справедливості, повазі до закону та відповідальності, що акумулюються в професійну суб'єктність офіцера, оскільки такий офіцер не здатний порушувати як етичні, так і правові норми діяльності. Вони зумовлюють результативність реалізації ними посадових компетенцій на різних ланках управління, сприяють реалізації власного організаційно-управлінського потенціалу в органах фінансово-матеріального та інших видів забезпечення, є надійною підвалиною незалежності, гнучкості та оперативності у прийняті та ухваленні відповідних фінансово-матеріальних рішень у стандартних і нестандартних ситуаціях організаційно-управлінської діяльності та здатності брати на себе відповідальність за її результати.

Показники такі: лідерство як суб'єкта фінансово-матеріального та інших видів забезпечення; офіцерська чесність як військового професіонала; повага до закону та відповідальність як організатора та управлінця в органі фінансово-матеріального забезпечення; організованість як суб'єкта конкретного в сфері військового управління як суб'єкта фінансово-матеріального та інших видів забезпечення. Інтегрованим проявом цих якостей виступає професійна суб'єктність як військового професіонала, управлінця, організатора фінансово-матеріального забезпечення. Ці критерії є мінімальними, зміст яких слід обов'язково доповнювати та змінювати певними показниками у залежності від того, яку конкретну посаду обіймає офіцер як певна посадова особа. Можуть бути й інші якості, які передбачені конкретною посадою в певній ланці військового управління в ЗС і МО України.

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THE ESSENCE AND DEVELOPING POTENTIAL OF SOCIAL PSYCHOLOGICAL TRAINING

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Abstract

In this article, the premise of K. Levin and his followers is quite legitimate, related to the fact that group forms of work contribute to obtaining feedback and empathy from group members who have common problems or experiences; create an atmosphere of acceptance of the values and needs of others; facilitates the resolution of interpersonal conflicts outside the group, allow you to modify your behavior depending on the styles of relationships among equal partners. At the stage of research, participants show empathy, tolerance to each other, begin to interact effectively when performing training tasks, interpersonal relationships are established that contribute to the creation of a positive psychological climate in the group. The purpose of the article is to summarize and analyze the results achieved, in relation to the training participants' experience gained in achieving group goals with their own contribution to this process. The functionality of the trainer at this stage is to differentiate responsibility for what is happening in the group between himself and the participants of the training, to provide assistance in case of misunderstanding, in productive interaction with leaders; in creating conditions for self-learning within the group. Of particular importance at this stage is the position of the trainer, associated with teaching group members how to reflect, analyze the products of activity, summarize, generalize the results achieved, and broadcast them in life outside the group.

Keywords: socio-psychological training, safe conditions, specific principles, effectiveness of psychological interaction, effective changes

The term "training" has many meanings. It is considered both as a dynamic process of education, upbringing, training, and as a method of corrective work with the help of intensive training, and as a multifunctional way of deliberate changes in the psychological Phenomena of a person, group and organization, aimed at increasing the degree of their "congruence" with themselves and the environment, and as a "multifunctional method of deliberate changes in the psychological Phenomena of a person, group and organization in order to harmonize the professional and personal existence of a person" (N.Yu. Khryashcheva) [1].

The multidimensionality of the use of the concept of "training" is predetermined by the solution of various problems related both to the personal growth of its participants and to the training of new psychological technologies.

For the first time, trainings in psychological practice were used by the students of K. Levin, who conducted classes under his guidance in the form of T-groups, the main idea of which was to actualize a conscious attitude to situations of interpersonal interaction. This idea was based on the fact that most effective changes in attitudes and behavior of people occur in society, and their prevention or correction is associated with overcoming authenticity [2].

In this context, the premise of K. Levin and his followers is quite legitimate, related to the fact that group forms of work contribute to obtaining feedback and empathy from group members who have common problems or experiences; create an atmosphere of acceptance of the values and needs of others; facilitate the resolution of interpersonal conflicts outside the group, allow you to modify your behavior depending on the styles of relationships among equal partners [3]

Socio-psychological training aimed at solving internal psychological problems of the individual. most often in psychological practice is carried out in individual and group forms. It is in practical training activities that communication skills and ways of communication are acquired and developed, turning into stable communication skills. In the course of performing practical training tasks, a person can make mistakes that do not entail serious consequences, learn to build relationships in various

activities and interact with other participants in the training space, which is the main goal of socio-psychological training.

Of great importance in conducting socio-psychological training are the safe conditions that the trainer creates in working with the group, allowing you to make mistakes and try again, experimenting to select what suits a particular person. In the organization of training work, the issue of staffing the group is extremely important. It is necessary to conduct preliminary individual interviews and a general conversation with the group. When forming a group, it is better not to include people with strongly stereotyped psychological defenses. Such activities can increase the subject's anxiety. In addition, it can have an unproductive effect on the group process. Also undesirable is the participation of people who do not associate the positive prospects of their development with training sessions, for whom this method is interesting only from the point of view of learning its educational function, who consider it as a means of pleasant pastime and relaxation.

In the process of conducting socio-psychological training, participants experience emotions of various modalities and a change in emotional states is observed, which leads to destabilization of self-regulation functions, therefore one of the main tasks of the trainer is to create conditions during the training process that contribute to the establishment of situations of psychological comfort and well-being for each participant of the training group. At the same time, a special role is given to the post-training support of the client, taking into account his activity and desire to change his behavior, interaction with others, taking into account the knowledge, skills and abilities gained in the training.

The work of the training group, as noted by the head of the Institute of Training in Russia N.Yu. Khryashchev, is distinguished by a number of specific principles that are universal and can be taken into account when organizing trainings of any kind, psychological [1]. B TOM including social

The principle of dialogization of interaction assumes that the full value is the leading one. It is interpersonal communication based on respect for the opinions of others, on trust, on the release of participants from mutual suspicion, insincerity and fear. Today it is absolutely necessary to replace the administrative-authoritarian style of relations with creative cooperation. This type of relationship acts, first of all, as an attitude, as the adoption by a teacher-trainer of a personal-equal position in relation to any participant.

The principle of voluntariness is the starting point in ensuring the successful work of the group. Group members should have a natural interest in their own change. You can be forced to attend a group, but not to study in it, achieving personal changes. The degree of closeness of the group determines the level of its cohesion

The principle of activity is manifested in the actualization of a person's ability to carry out transformations that are significant for others. Activity expresses an independent, individual position of a person. his subjective attitude to activity. She, according to E.V. Sidorenko. is the main norm of behavior in the training, implies the constant real inclusion of each participant B intensive group interaction purpose of active peering, listening. empathy in oneself, partner, group as a whole. In life, a person often closes in on himself, centered only on his own problems. It is necessary to learn to combine this immersion in oneself with an active involvement in another, in the analysis of group processes.

Two levels of activity are taken into account in the training: object activity (the individual acts as an object of external influences, but performs a productive, reproducing activity); subjective activity (an individual acts as a subject of activity of a creative, transformative nature) [4, 5]

The activity of the training participant lies in the ability to self-knowledge and reflection, highlighting one's personal strengths and weaknesses, analyzing individual actions and behavior in general, as well as finding the optimal forms and mechanisms of communication in business and interpersonal contexts Self-analysis helps to find personal resources, mental resources in general, the development of which the training participant will achieve high success in the field of professional activity and professional communication. In the process of joint activity, each participant in the socio-psychological training contributes and has the opportunity to compare his view of the problem with the opinion of others and, possibly, change or supplement his opinion.

The organization of activities in the training space implies the presence of several principles:

The principle of a psychological event involves a frank discussion of the behavior of the participants, the inclusion of emotionally rich feedback means in the training. In life, it is not enough to rely only on the evolutionary paths of personality development, in particular, its communicative qualities. For the implementation of personal changes, the restructuring of relations, sharp moments, explosions, upheavals are needed, ”which, according to A.S. Makarenko but and creative. should not only be conflicting. The principle of self-diagnosis is associated with the need for reflection of the participants in the socio-psychological training, turning to their own social experience. The leader includes in the content of the lessons questions and exercises related to the personal experience of the participants. requiring problems and compiling stories about their own psychological possible ways to solve them. After the formation of self-diagnosis, the psychological support of the group is important.

The principle of psychological natural materialization of Phenomena) assumes (studied social-experience of various interpersonal phenomena by each participant of the training. Thanks to materialization, many manifestations of the human psyche appear before the members of the group not only in the form of abstract, theoretical concepts, but being personally deeply experienced, they become the property of their practical experience.

Communication on the principle of "here and now" is to create conditions conducive to the establishment of participants in the activity of communication. situations of trust between In some cases, in interpersonal communication, many participants have psychological defense mechanisms, which manifests itself in isolation, tension, frustration. Hence, the main task of the trainer is to create the most comfortable, trusting, safe atmosphere that contributes to the development of the individual characteristics of the participants during the socio-psychological training.

The principle of personification of statements is manifested in the open position of the trainer, in which he expresses his opinions in a convincing manner and indicates his position, which encourages the participants of the training group to use personal forms of judgments in their speech, such as: "I am sure that ...", "I I think that ... ", etc.

The principle of emphasizing the language of feelings. In accordance with this principle, the features of the emotional-volitional sphere and emotional states begin to play the leading role. The main task of the trainer is to form in the participants of the training group the ability to use verbal means to indicate such states, to actualize the need to restructure their style T.e. communication to identify and, if possible, more adequately express their feelings in verbal form -

The principle of confidential communication is central to the organization of the training space, which affects the dynamics of the group's development and the effectiveness of its activities. To create trusting communication, he offers participants a form of address “to you”, seeks to create a situation of intimacy of interpersonal communication, comfort of interaction in the training group at the expense of the truthful. honest communication with each other.

The principle of confidentiality is reduced to the observance of a number of previously discussed rules:

- everything said is not taken out of the group;
- the presence of discussions on topics of interest to all participants in the training group;
- ethics and tact in communication.

The principle of a research creative position is connected with the fact that during the training, the group members get acquainted with the main patterns of group development, the features of communication and interaction between people, with the mechanisms of social perception that exist in psychological science, on the basis of which they reveal their personal and individual resources. The meaning of the coach's work is to construct situations. aimed at testing, experimenting, training different ways of behavior in accordance with the creative environment, characterized by problems, uncertainty, acceptance, non-judgmental.

The principle of objectification (comprehension) of behavior is associated with changes in the training space due to effective feedback, video recording of the speech and behavioral reactions of

group members in certain situations, followed by viewing and discussion. The implementation of this principle may have a negative impact on its participants, which implies a high level of a professional leader in blocking undesirable manifestations. competence

The principle of partnership (subject-subject) communication presupposes psychological equality. coordination of Interests and observance of certain rules both between group members and between the group and the leader, the opportunity for everyone to freely express their opinion, protest, express their feelings, make suggestions, etc. The feeling of one's psychological equality is not always accepted positively by the participants of the training, and for others it even constitutes a significant difficulty (this is especially true for the status positions of the leader-subordinate). In addition, some participants in the training may have difficulty comparing themselves with another member of the group who is more successful, more intelligent, more self-confident, etc. The task of the training leader in such situations is to create an atmosphere of security, trust, and openness in the group [6].

In the studies of domestic psychologists (E.V. Sidorenko, N.Yu. Khryashchev and others), one of the conditions for the effective implementation of the socio-psychological implementation of the above principles, which contributes to the effectiveness of psychological influence [1, 7].

An analysis of psychological and pedagogical research and many years of practical experience has shown that the effectiveness of solving applied problems by the method of socio-psychological training is largely determined by taking into account the genesis of its organization, the gradual process of interaction between participants.

Thus, during the socio-psychological training, the dynamics of the development of the group is observed, providing for certain stages and stages at which the ability of the trainer to manage the group and resolve the conflict situations that have developed in it is observed. When planning a socio-psychological training, the lead trainer) Should take into account the specific goals and objectives of each stage of group dynamics.

The developing potential of socio-psychological training is maximally manifested with the proper use of the mutons of its organization and conduct.

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BRIEF OVERVIEW OF RESEARCH RESULTS SENSITIVITY OF PRIMARY EXPLOSIVE SUBSTANCES TO THE ACTION OF LASER RADIATION

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КОРОТКИЙ ОГЛЯД РЕЗУЛЬТАТІВ ДОСЛІДЖЕЕНЬ ЧУТЛИВОСТІ ПЕРВИННИХ ВИБУХОВИХ РЕЧОВИН ДО ДІЇ ЛАЗЕРНОГО ВИПРОМІНЮВАННЯ

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Abstract

The review presents the results of the first studies in the history of the sensitivity of initiating primary explosive substances to laser monopulse radiation. The dependences of the regularity of one hundred percent ignition of explosive substances on the density of the threshold energy of the laser beam, the absorption coefficient of light energy, the wavelength of laser radiation and the duration of the pulse are established

Аннотация

В огляді наведено результати перших в історії досліджень чутливості ініціюючих первинних вибухових речовин до лазерного моноімпульсного випромінювання. Встановлені залежності закономірності сто відсоткового запалення вибухових речовин від густини порогової енергії лазерного променя, коефіцієнту поглинання світлової енергії, довжини хвилі лазерного випромінювання та тривалості імпульсу.

Keywords: explosive composition, ignition, detonation, energy of laser radiation

Ключевые слова: вибуховий склад, запалення, детонація, енергія лазерного випромінбювання

Вивчення процесу запалювання вибухових речовин (ВР) імпульсними потоками світла було розпочато у шестидесяті роки минулого століття. В якості джерела світла використовувалися кварцеві імпульсні лампи, сильноточный іскровий розряд в повітрі, фронт ударної хвилі. Тривалість світлових імпульсів знаходилася в межах 10^{-3} с – 10^{-6} с. Вивчалася дія світла на азиди срібла, свинцю, нітрид срібла, пентаерітриттетранітрат (ТЕН), стифнат свинцю та інші речовини. Результати досліджень найдетальніше викладені в роботах [1-4]. Для з'ясування механізму запалювання були виміряні спектри поглинання ряду ВР на спеціально приготованих зразках. Так, азид срібла використовувався у вигляді тонких прозорих пластинок завтовшки 10^{-4}-10^{-5} м. Результати вимірів [1] показали, що при кімнатній температурі ця речовина сильно поглинає світло з довжиною хвилі менше λ=0,35 мкм. Коефіцієнт поглинання при λ=0,3 мкм складає приблизно 10^3 $см^{-1}$ різко збільшується при подальшому зменшенні довжини хвилі. При λ>0,385 мкм, аж до ближньої інфрачервоної області спектру, поглинання невелике. Подібні результати отримані і для інших вибухових речовин, таких як азиди талія, свинцю, фульмінат срібла, стифнат свинцю, тен.

Дані по виміру спектральних коефіцієнтів поглинання ВР дозволили запропонувати тепловий механізм запалювання, який полягає в тому, що світло в синій і ультрафіолетовій частині спектру, поглинається в тонкому шарі ВР (завтовшки 10^{-3}-10^{-4} см) і викликає його розігрівання,якого достатньо для ініціації хімічної реакції. На важливу роль короткохвильового випромінювання в запаленні ВР вказують експерименти по запаленню стифнату свинцю світлом від іскрового розряду. Між іскровим проміжком і ВР встановлювався кварцевий екран або водяний фільтр. Енергії запалювання в обох випадках виявилися близькими, попри те, що інфрачервоне випромінювання ослаблялося водяним фільтром в значно більшому ступені, ніж кварцевою пластинкою.

Висновок про визначальну роль в процесі запалювання тонкого поверхневого шару речовини підтверджується рядом інших результатів. Наприклад, в роботі [2] повідомляється, що ініціація азиду свинцю не залежить від чистоти матеріалу, дисперсності, щільності зразка. Крім того, в цій роботі помічений вплив розльоту продуктів розкладання речовини на параметри запалення, що характерно для великих показників поглинання ВР [5]. Вивчалася також зміна мінімальної енергії займання залежно від початкової температури зразка ВР [1]. Показано, що між енергією запалювання і температурою ВР існує лінійна залежність. Збільшення температури призводить до зниження енергії ініціації, що узгоджується з теорією поверхневого теплового запалювання [6].

Детальніші дослідження, зокрема, виміри фотопровідності, показали, що на початковій стадії процесу ініціації разом з чисто тепловим розкладанням речовини можливе протікання фотохімічної реакції при дії випромінювання, спектр якого відповідає області поглинання речовини. Так, при запаленні азидів металів спочатку відбувається фотохімічне розкладання поверхневого шару речовини, а потім тепло, що виділилося при розкладанні, прискорює розвиток реакції по тепловому механізму. Таким чином, в результаті проведених експериментальних і теоретичних досліджень ініціації ВР імпульсними джерелами світла суцільного спектру встановлено, що процес запалювання розвивається в поверхневому шарі речовини в результаті його розігрівання світлом в ультрафіолетоій і синій частині спектру. З появи оптичних квантових генераторів розпочалися дослідження процесу запалення ВР лазерним випромінюванням. Більшість експериментів проведена з використанням наносекундних (тривалість імпульсу τ =20-50 нс), мікросекундних (τ =0,5-0,7 мкс) та мілісекундних (τ ~1 мс) імпульсів неодимового (довжина хвилі λ =1,06 мкм) та рубінового (λ =0,69 мкм) лазерів (див. табл. 1, показана у роботі [7]).

Аналізуючи отримані результати, зупинимося на питаннях, що мають відношення до проблем механізму запалення ВР і практичних застосувань методу лазерної ініціації. Попри те, що більшість досліджених ВР слабо поглинають випромінювання неодимового і рубінового лазерів, отримані у ряді робіт значення критичної щільності енергії запалення виявилися порівнянними або меншими відповідної щільності енергій, виміряних при ініціації світла суцільного спектру. Це видно з табл. 1, в якій приведені відомі нині літературні дані. Окрім

цього, як і слід було очікувати, результати досліджень показують, що чутливість до дії лазерного імпульсу ВР, що ініціюють, значно вища, ніж чутливість вторинних ВР. Іншими словами, загальновизнаний ряд чутливості ВР, в основному, корелює з чутливістю до лазерної дії.

Дані таблиці 1 свідчать про деякі закономірності, встановлені дослідниками. На прикладі ініціювання порошку тену з вільною відкритою поверхнею і тену з поверхнею, вкритою скляною пластиною, одержані протилежні результати. У першому випадку підірвати тен не вдалося, а у другому були одержані 100 відсоткові позитивні результати. Це перед усім свідчить , що дуже важливим параметром є замкнутий простор, який не дає змоги вільно розвантажуватися продуктам вибуху.

З результататів, наведених у табл. 1, виходить, що чутливість ВР до дії лазерного випромінювання залежить від тривалості лазерного імпульсу: ззбільшення тривалості імпульсу приводить до зростання порогу запалення, а зменшення – навпаки [3, 8, 9].

Таблиця 1

Критична густина енергії запалення ВР лазерним імпульсним випромінюванням [7]

Найменування ВР	Довжина хвилі випромінювання λ, мкм	Тривалість імпульсу τ, с	Порогова густина енергії запалення $E_{кр}$, Дж/см^2	Коментар	Джерело інформації
Азид срібла	1,06	$5\cdot10^{-8}$	0,02	Вільна поверхня. Тиск пресування $P_{пр}$=0,5 кбар	[9]
-“-	-“-	10^{-3}	2,1		
Азид свинцю	-“-	$5\cdot10^{-8}$	0,1		
-“-	-“-	10^{-3}	3,0		
Гримуча ртуть	-“-	$5\cdot10^{-8}$	1,0		
-“-	-“-	10^{-3}	3,0		
ТНРС	-“-	$5\cdot10^{-8}$	0,4		
-“-	-“-	10^{-3}	2,2		
Азид свинцю	-“-	10^{-3}	0,8	$P_{пр}$=15 кбар	[11]
-“-	-“-	$3\cdot10^{-8}$	$3,8\cdot10^{-3}$		
-“-	-“-	$6\cdot10^{-7}$	$3,0\cdot10^{-2}$	$P_{пр}$=15 кбар	[10]
-“-	-“-	10^{-7}	0,8	Насипна густина	[3]
β -азид свинцю	0,69	$8\cdot10^{-8}$	$1,5\cdot10^{-3}$	Мономонокрістали 40 мкм×200 мкм× ×10 мм	[12]
ТЕН	-“-	$4\cdot10^{-8}$	$1,5\cdot10$	Тиск притиснення: $P_{ВН}$ = 20 кбар	[13]
-“-	-“-	-“-	10^3	$P_{ВН}$=100 бар	
-“-	0,69	$3\cdot10^{-8}$	$1,3\cdot10^{-2}$	$P_{ВН}$=14 кбар	
-“-	1,06	$3\cdot10^{-9}$	10^3-10^4	Вільна поверхня	[8]
Октоген	0,69	$3\cdot10^{-8}$	15	$P_{ВН}$=100 бар	[13]
Гексоген	-“-	-“-	30		
Піроксилін	1,06	-“-	60		
0,45Si + 0,55P_3O_4	-“-	10^{-3}	10,6	$P_{ВН}$=100 бар	[14]
-“-		$2\cdot10^{-8}$	2,9		
0,25А1+0,75КС10_4	-“-	10^{-3}	6,6		
-“-	-“-	$2\cdot10^{-8}$	5,0		

Як правило добавки сенсибілізаторів або флегматизаторів у ВР привзодять відповідно до збільшення або зменшення чутливості ВР. Тобто, незалежно від джерела зовнішньої енергії, яку використовують для ініціації ВР, вплив сенсибілізаторів або флегматизаторів при дії лазерного імпульсного випромінювання абсолютно такий як при електричному і чи вогневому

ініціюванні. Такий висновок було зроблено [15- 17] під час дослідження ТЕНу. Але в роботі [18] показано, що тен під тиском $1{,}76 \times 10^8$ Па з добаками сажі 0,1-1 % демонструє підвищення чутливіості. Цей ефект пов'язаний з тим, що ВР із сажею використав надмірну енергію, яка була запасеною під час стиску. Після того як мікрочастики тену були піддані стиску 2×10^8 Па [18- 21] майже на три порядки до лазерного імпульсу збільшується чутливість тена з добавкою (до 1%) мікрочастинок алюмінію. Мінімальна густина енергії запалювання складає ≤0,1 Дж/см^2. Аналогічні експерименти проводили з азидом свинцю [22] в інтервалі тисків $(1\text{-}15) \times 10^8$ Па.

В наукових статтях [9, 13, 15, 22] та інших джерелах інформації наведені результати експериментальних досліджень закономірностей , які характеризують фізичні хімічні особливості взаємодії випромінювання лазерного моноімпульсу з енергонасиченими речовинами – первинними і вторинними ініціюючими вибуховими речовинами. Наприклад, показано, що ВР в умовах зростання зовнішнього тиску стають більш чутливими до лазерного ініціювання, тобто із зростанням тиску густини енергії ініціації зменшується. Окремо слід прокоментувати цікавий експериментальний результат, який полягає в тому, що при скиданні тиску і подальшій дії величина густини критичної енергії запалювання ($E_{кр}$) азиду залишається не змінною і відповідає максимальному стискуванню. Такий результат одержано для азидів свинцю і срібла. Що стосується таких первинних ВР як тринітрорезорцинат свинцю, гримуча ртуть і вторинних – тен, октоген, гексоген – такий ефект не спостерігався.

Для практичних цілей, а також для розуміння механізму запалювання важливе значення мають дослідження оптичних властивостей ВР. У роботах [3, 8, 12] виміряні показники послаблення k_λ і коефіцієнти дифузного відбиття R_λ ряду ВР показані у [23].

Коефіцієнти R_λ вимірювалися за допомогою інтегруючої сфери кульового фотометра. Використання зразки баритового еталону (з відомим значенням коефіцієнту відбиття) використовувалося для визначення абсолютного значення R_λ. Більша частина лазерного випромінювання відбивається від зразків ВР. Цей ефект спостерігається на довжині хвилі λ=1,06 мкм (лазер на неодимовому склі) і λ=0,69 мкм (рубіновий лазер).

Роль повітря в порах ВР під час дії лазерного випромінювання у випадках стиску від 2,7 Па до 10^6 Па не була помітною, тому ы відмінності не встановлено. Якщо ж замість повітря буде інший газ (наприклад, аргон), то слід очікувати істотних відмінностей ролі газів у процесах ініціації ВР. Ця думка ґрунтується на тому, що густина оптичного пробою енергії в аргоні і повітрі при 10^5 Па відрізняється майже у 10 разів. Відмінність зростає на два порядки якщо зменшитиі тиск повітря на п’ять порядків. Очікувана аномально велика відмінність може спостерігатися коли замість аргона заповнити пори ВР ксеноном, неоном, чи іншим газом, у якого перша енергія іонізації в ряду інертних газів буде найменшою. Це довели в своїх експериментах фахівці Національного технічного університету «Дніпровська політехніка».

Світлочутливі вибухові композити для засобів підривання лазерних систем. Світлочутливі вибухові композити (СВК) являють собою полімерну матрицю, в якій розміщені мікрочастинки вибухової речовини [24-26]. В цих та інших роботах процес запалювання світлочутливих вибухових композитів, табл. 2, ініціює багатократне розсіювання лазерного випромінювання в об'ємі композиту. Впевненість існування цього механізму має неодноразове експериментальне підтвердження і теоретичну обґрунтованість. Було показано залежність концентрації зв'язуючого матеріалу, товщини зразків СВК і геометрії лазерного пучка на чутливість до дії лазерного моноімпульсного випромінювання. Отримання світлочутливих композитів значно розширило пошук первинних ВР для лазерних засобів підривання. За даними М.О.Ілюшина зараз у світі відомо більше 100 найменувань ВР для виготовлення зразків СВК. В дослідженнях використовувався композит ВС2, який характеризується аномально високою чутливістю до дії лазерного моноімпульсу.

Результати досліджень впливу концентрації полімеру і товщини зразка СВК на чутливість до лазерного моноімпульсу опубліковані в роботах [24-29], у яких досліджено деякі СВК, показані у табл. 2. Полімери ПМВТ–3М і ПММ використовувалися в якості матриці світлочутливого вибухового композиту. Концентрація полімеру змінювалася у діапазоні 10-50%.

В експериментах досліджувався важливий при практичному застосуванні такий параметр як чутливість СВК до дії лазерного моноімпульсу.

Таблиця 2

Деякі вибухові та фізичні характеристики світлочутливих вибухових композитів за даними [28-31]

СВК, Тип ВС	Густина ρ, г/см^3	Швидкість детонації D, км/с	Чутливість до тертя, кгс/см^2	$T_{нир}$, К	Критична енергія запалення $E_{кр}$, Дж/см^2
1				573	<0,1
2	3,00	6,5		2073	$2{,}3\cdot10^{-3}$
3	1,97			553	>13
4	2,03			538	>16
5	1,94			305	>12
6	1,95	7,71		471	1,3
7	4,6			623	$5\cdot10^{-3}$
8	1,97	7,14	1900		>14
9	1,81	7,43	600		>14
10	2,05	8,03	840		>7
11	2,08		4800		>15
12	1,83	6,42 (ρ=1,74)	3600		>15
13	1,88	8,94	1700		>16
14	1,88		200		>13
15	1,2				14 (горіння)
16	1,1	5,1		412	$12\cdot10^{-3}$
17		6,7		455	$40\cdot10^{-3}$
24	3,8	4,5			0,7 [33]
25	3,08	5,2			0,25 [33]

На рис. 1-4 представлені залежності світлочутливих вибухових композитів ВС2 і ВС16 до дії лазерного випромінювання та залежності від матеріалу матриці. Використані результати робіт **[24-31].**

В експериментах лазерний пучок діаметром 1,5 мм на напіввисоті інтенсивності лазерного випромінювання (рис. 1) розширявся негативною лінзою до діаметра 4,5 мм, тобто розмір зображення на зразку СВК збільшувався в три рази (рис. 2).

За результатами експериментів одержані наступні закономірності, які слід враховувати при моделюванні та конструюванні оптичних детонаторів за класичною схемою або мікродетонаторів з моно зарядом СВК.

На рис. 1 залежність чутливості композиту ВС2 до дії лазерного випромінювання (діаметр пучка 1,5 мм) виражається кривою, близькою до параболи, при цьому максимум чутливості E_s композиту лежить на вершині параболи, що відповідає концентрації маси полімеру 20%. Збільшення або зменшення концентрації маси полімеру призводе до зменшення чутливості ВС2. Збільшення діаметра лазерного пучка від 1,5 мм до 4.5 мм зменшує значення мінімальної чутливості ВС2 до лазерного моноімпульсу майже у два рази, при цьому концентрація полімеру, яка відповідає мінімальному значенню чутливості збільшилася до 30%; Якщо на рис. 1 залежність чутливості від дії лазерного імпульсу наближено могла бути вираженою квадратичною функцією, то на рис. 2 закономірний характер у певному сенсі буде тільки дотримуватися встановленої тенденції – збільшення або зменшення концентрації маси полімеру призводе до зменшення чутливості композиту ВС2. Якщо пересуватися від точки максимальної чутливості у бок збільшення концентрації полімеру, то спостерігається дуже різке зменшення чутливості. При зменшенні концентрації полімеру темп збільшення чутливості має характер дуже повільний. Зразки ВС2, що містять 50% полімеру, підривання спостерігається

тільки частини покриття.

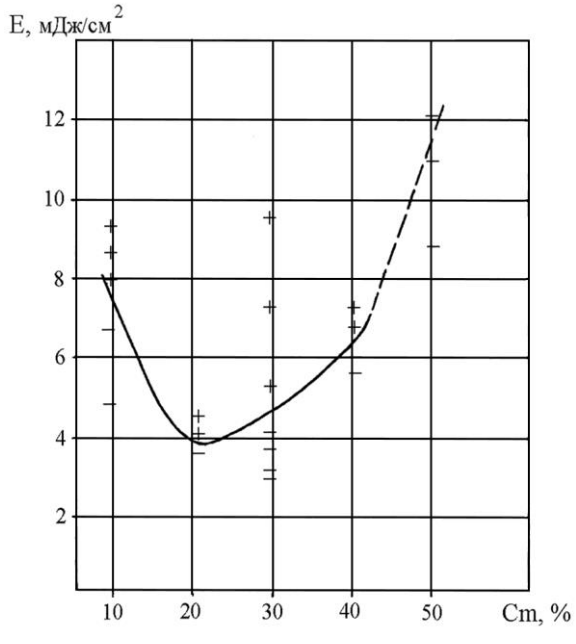

Рис. 1 – Чутливість композиту ВС2 до лазерної дії. Зв'язка з ПМВТ–3М, діаметр лазерного пучка 1,5 мм

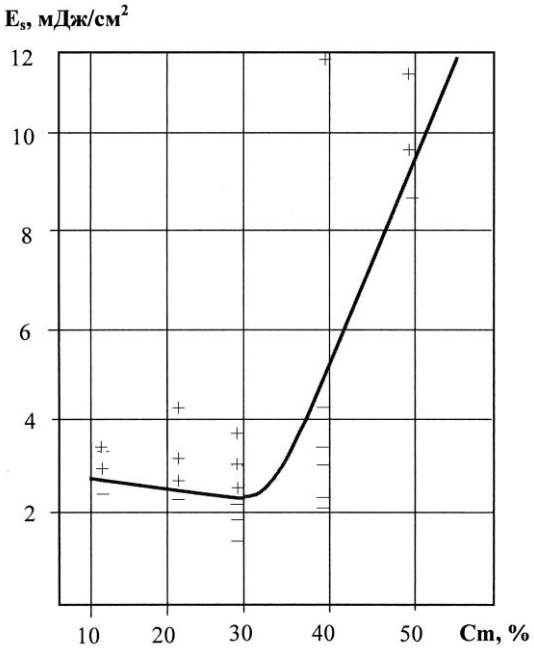

Рис. 2 – Чутливість композиту ВС2 до лазерного імпульсу. Зв'язка з ПМВТ–3М, діаметр пучка 4,5 мм

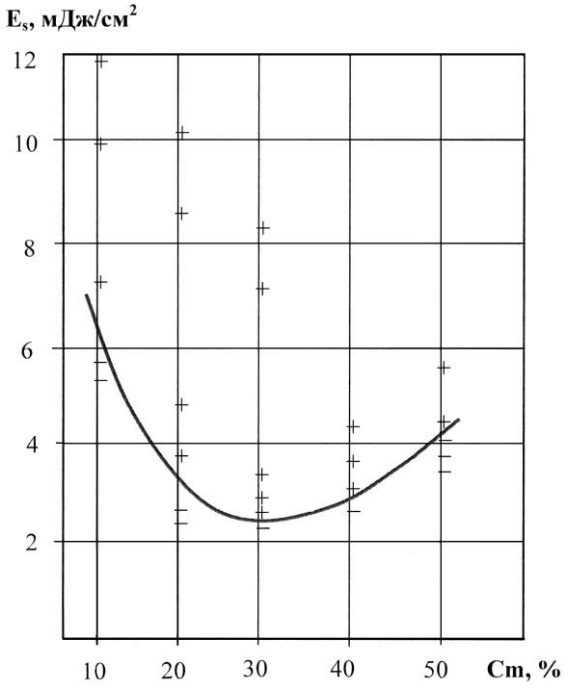

Рис. 3 – Чутливість композиту ВС2 до лазерного імпульсу. Зв'язка з ПММ, діаметр пучка 4,5 мм

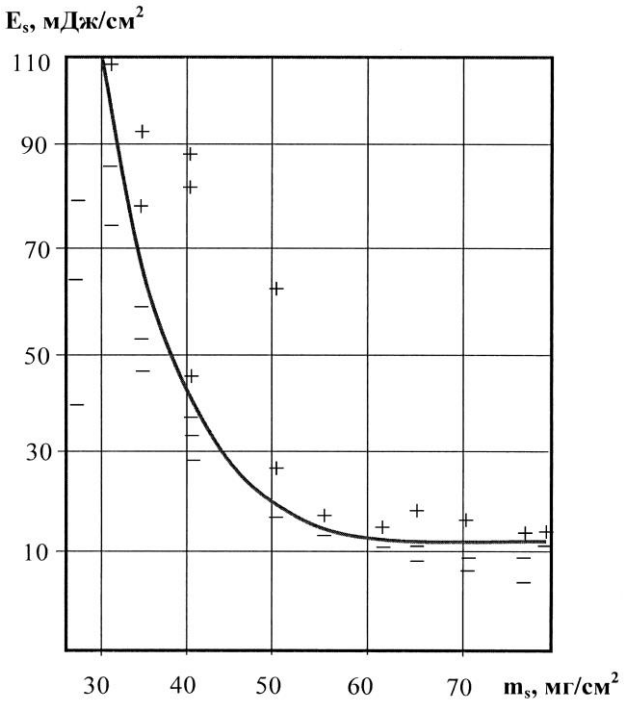

Рис. 4 – Залежність чутливості композиту ВС16 від товщини зразка; діаметр пучка 4.5 мм

На рис. 1 залежність чутливості композиту ВС2 до дії лазерного випромінювання (діаметр пучка 1,5 мм) виражається кривою, близькою до параболи, при цьому максимум чутливості E_s композиту лежить на вершині параболи, що відповідає концентрації маси полімеру

20%. Збільшення або зменшення концентрації маси полімеру призводе до зменшення чутливості ВС2. Збільшення діаметра лазерного пучка від 1,5 мм до 4.5 мм зменшує значення мінімальної чутливості ВС2 до лазерного моноімпульсу майже у два рази, при цьому концентрація полімеру, яка відповідає мінімальному значенню чутливості збільшилася до 30%; Якщо на рис. 1 залежність чутливості від дії лазерного імпульсу наближено могла бути вираженою квадратичною функцією, то на рис. 2 закономірний характер у певному сенсі буде тільки дотримуватися встановленої тенденції – збільшення або зменшення концентрації маси полімеру призводе до зменшення чутливості композиту ВС2. Якщо пересуватися від точки максимальної чутливості у бок збільшення концентрації полімеру, то спостерігається дуже різке зменшення чутливості. При зменшенні концентрації полімеру темп збільшення чутливості має характер дуже повільний. Зразки ВС2, що містять 50% полімеру, підривання спостерігається тільки частини покриття.

Чутливість СВК залежить від концентрації зв'язуючого матеріалу: при збільшенні вмісту полімеру густина енергії запалювання зменшується, досягаючи мінімального значення, а потім при подальшому збільшенні концентрації полімеру зростає, тобто, чим менше радіус, тим більше густина енергії запалювання, що співпадає з результатами вище цитованих робіт.

Результати експерименту за визначенням E_s залежно від концентрації полімеру ПМВТ-3М і ПММ проілюстровано на рис. 2 і 3. Мінімальне значення щільності енергії запалювання відповідає $c_m \approx 30\%$ і дуже близькі абсолютні значення мінімуму E_s, попри те, що в першому та другому випадку використовувалися полімерами ПМВТ–3М і ПММ відповідно.

Зв'язок характеристики чутливості E_s і експериментально вимірюваної енергії $W_{екс}$ находять в виразу, запропонованому в роботі [27]

$$E_s = 9{,}05\ W_{екс}.$$

Всі вивчені світлочутливі вибухові композити характеризуються залежністю чутливості до дії лазерного випромінювання від поверхневої густини шару покриття. Яскравим прикладом є експериментальні результати дослідження з лазерного ініціювання композиту ВС16, рис. 4. При товщині шару покриття $m_s \sim 60–90$ мг/см^2 крива залежності асимптотично наближається до максимуму чутливості композиту відносно дії лазерного випромінювання. При зменшенні товщини шару покриттія від $m_s \sim 60–90$ мг/см^2 до 25 мг/см^2 чутливість композиту зменшується, а з густиною маси 20 мг/см^2 ініціювати яке-небудь хімічне перетворення в композиті не вдалося. У структурі досліджуваного ВС16 не виявлено слідів механічного чи теплового руйнування, а також навіть часткового розкладання композиту, що чітко узгоджується з даними про поширення світла у розсіючому середовищі [31].

У формуванні осередку запалювання важливу роль виконує вільна поверхня зразка СВК про що свідчить результат, показаний на рис. 4.

Досвід експериментальних досліджень, отриманий за останні три десятиріччя 20-го сторіччя в області збудження хімічних реакцій у ВР, отримані нові закономірності, обгрунтовні фізичні механізми ініціювання детонації у зарядах ВР, використані для створення механічних методів навантаження конструкцій [32, 33], виготовлення світлочутливих первинних вибухових композитів [34, 35], створення профільованих детонаційних хвиль [36-40] і лазерних систем ініціювання зарядів ВР [41, 42].

Серед десятка перспективних світлочутливих вибухових композитів найбільш перспективними (за критерієм мінімальної енергії запалювання) для використання в засобах висадження лазерних систем слід виділити речовини марки ВС2, ВС7, ВС16 і ВС17 [29, 43]. В якості первинних ініціюючих композитів нами будуть використані ВС2, що характеризується аномально високою чутливістю до лазерного випромінювання, і ВС17, що задовольняє практично всім вимогам технічної та екологічної безпеки [44-47]. В цитованих роботах досліджено найбільш сприйнятливі до лазерного моноімпульсу світлочутливі вибухові композити, які можна рекомендувати у якості первинних СВК до використання в оптичних детонаторах, табл. 3.

Таблиця 3

Критична енергія ініціювання СВК лазерним імпульсним випромінюванням

Композити на основі комплексних перхлоратів	Критична енергія запалювання $E_К$, Дж/см^2
ВС2	$1{,}1\times10^{-5}$
ВС7	$50{,}3\times10^{-5}$
ВС16	$57{,}5\times10^{-5}$
ВС17	136×10^{-5}

Первинна вибухова речовина є головним елементом якої завгодно системи ініціювання не тільки за її надійність ініціювання зарядів ВР, але й за визначенням безпекової складової та прецизійності спрацювання засобів підривання.

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USING E-LEARNING RESOURCES IN THE LEARNING PROCESS: ADVANTAGES, DISADVANTAGES

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ОҚУ ПРОЦЕСІНДЕ ЭЛЕКТРОНДЫҚ БІЛІМ БЕРУ РЕСУРСТАРЫН ПАЙДАЛАНУ: АРТЫҚШЫЛЫҚТАРЫ, КЕМШІЛІКТЕРІ

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Abstract

Were described advantages and disadvantages of using e-leaming resources in the learning process. The article gives a definition of e-learning resources. The advantages of e-learning resources include a multimedia presentation of information, process modeling, ease of finding information, interactivity, digital distribution, openness to the introduction of new entries. The disadvantages include a glut of the educational process, the emergence of the problem of information security of the individual, the occurrence of additional cognitive load, deflection member of the educational trajectory. With the use of e-learning resources were related procurement problems of modern technology, information structuring, copyright, training, able to teach with electronic resources. The paper concludes that e-learning resources favor the development of information skills, contribute to the formation of competitive abilities of the individual in the labor market. E-learning resources well increase the importance of self-educational activity of students. Integrated use of traditional and e-learning will help formulate a comprehensive educational trajectory, and thus achieve the desired result.

Аннотация

Оқу процесінде электрондық білім беру ресурстарын пайдаланудың артықшылықтары мен кемшіліктері сипатталған. Мақалада электронды білім беру ресурстары терминінің анықтамасы келтірілген. Электрондық білім беру ресурстарының артықшылықтарына ақпаратты мультимедиялық ұсыну, процестерді модельдеу, ақпаратты іздеудің ыңғайлылығы, интерактивтілік, желіні тарату, жаңа жазбаларды енгізуге ашықтық жатады. Кемшіліктерге оқу процесінің шамадан тыс қанықтылығы, тұлғаның ақпараттық қауіпсіздігі проблемасының пайда болуы, Қосымша когнитивті жүктеменің пайда болуы, пайдаланушының білім беру траекториясынан ауытқуы жатады. Электрондық білім беру ресурстарын пайдалана отырып, заманауи техниканы сатып алу, ақпаратты құрылымдау, авторлық құқық, электрондық ресурстармен оқытуды жүргізуге қабілетті кадрларды даярлау мәселелері де байланысты. Мақалада электронды білім беру ресурстары ақпараттық құзыреттіліктің дамуына ықпал етеді, еңбек нарығында бәсекеге қабілетті тұлғаның қалыптасуына ықпал етеді деген қорытынды жасалады. Электрондық білім беру ресурстары оқушылардың дербес білім беру қызметінің маңыздылығын арттырады. Дәстүрлі және электронды оқыту құралдарын кешенді пайдалану біртұтас білім беру траекториясын қалыптастыруға, демек, қажетті нәтижеге қол жеткізуге көмектеседі.

Keywords: electronic educational resources, information culture, information society, information space, information technology in education, information resources, IT-technologies.

Кілтті сөздер: Электрондық білім беру ресурсы, ақпараттық мәдениет, ақпараттық қоғам, ақпараттық кеңістік, білім берудегі ақпараттық технологиялар, ақпараттық ресурстар, IT-технологиялар.

Қазіргі уақытта Қазақстанда әлемдік ақпараттық-білім беру кеңістігіне кіруге бағытталған жаңа білім беру жүйесі қалыптасуда. Қазіргі білім беру мекемесі жоғары технологиялық ортаға интеграциялануға ұмтылады.

Білім беруде қолданылатын ақпараттық технологиялар барлық сатылар мен деңгейлердегі заманауи білім беру жүйелерінің маңызды компоненттеріне жатады. Білім беру процесін ақпараттандыру білім беру жүйесін ақпараттық құралдармен, ақпараттық технологиялармен және ақпараттық өнімдермен қанықтыруға байланысты іс-шаралар кешені ретінде ұсынылады. АТ-ны білім беруде енгізудің арқасында білім беру процесінің барлық қатысушылары үшін: қажетті ақпаратты іздеуге және оған қол жеткізуге уақытты қысқартудан, білім беру мазмұнын жаңартуды жеделдетуден бастап, білім беруді даралау деңгейін, оның жеке бағдарын арттыруға дейін жаңа мүмкіндіктер жасалады.

Оқу үдерісі тұрғысынан ақпараттық технологияларды енгізу білім беру жүйесінің ақпараттық ортасы дәстүрлі және инновациялық технологияларды қамтитын әртүрлі тасымалдағыштарда және әртүрлі символдық жүйелерде ақпаратты ұсынудың көп деңгейлі жүйесі болып табылатындығына әкелді.

Қазіргі уақытта ақпараттық технологиялар білім беру процесінде келесі бағыттарда қолданылады:

* сабақтарды дайындау және өткізу кезінде;
* авторлық мультимедиялық құралдарды жасау үшін;
* білім алушылардың жеке және топтық ғылыми қызметі шеңберінде;
* білім беру процесін басқаруда[1].

Жоғары кәсіптік білім берудің федералды мемлекеттік стандарты оқу процесінде электрондық білім беру ресурстарын белсенді пайдалануды қамтиды. Мұндай инновация табиғи болып табылады, өйткені ол қоғам дамуының негізгі тенденцияларына сәйкес келеді. Қазіргі қоғамға ақпараттық мәдениеттің жоғары деңгейі бар мамандар қажет [2]. Ақпараттық мәдениет адамның ақпараттық ортамен өзара әрекеттесуінде білім, дағдылар мен рефлексиялық көзқарастар кешенінің болуымен көрінеді. Зерттеудің ерекшелігін ескере отырып, электрондық білім беру ресурстарын (ЭОР) пайдаланудың басты артықшылығы ретінде ақпараттық мәдениетті қалыптастыруды бөліп көрсетеміз.

О.В.Насс жұмысында, электрондық білім беру ресурстары "мұғалімдер оқыту мақсаттарына жету үшін жобалауға және пайдалануға болатын компьютерлік құралдар" ретінде түсіндіріледі [3].

Жаһандану жағдайында білім беру жүйесін ақпараттандыру процестерін зерттеу тиімділікті бағалаудың инновациялық критерийлеріне сүйене отырып, ЭОР қолданудың бірқатар артықшылықтарын тұжырымдауға болады:

1) Ақпаратты мультимедиялық ұсыну материалды тиімді игеруге көбірек мүмкіндік береді. Біріншіден, психологиялық-педагогикалық зерттеулер оқытудың тиімділігі барлық сезім мүшелерінің белсенділену дәрежесіне тікелей байланысты екенін көрсетті. Мультимедиа құралдары адамның сезім мүшелеріне бір уақытта әсер етуді қамтиды. Екіншіден, ақпараттың әр түрлі ұсынылуы ұсынылған материалды өз бетінше игеруге мүмкіндік береді, бұл өз кезегінде танымдық белсенділікті жандандыруға және инновациялық ойлауды қалыптастыруға ықпал етеді;

2) арнайы жабдықтар мен реактивтерді пайдалануды алмастыратын әртүрлі процестерді модельдеу мүмкіндігі;

3) интерактивтілік;

4) желіні тарату мүмкіндігі;

5) ақпаратты іздеудің ыңғайлылығы;

6) жаңа деректерді енгізуге ашықтық;

7) деректерді сақтаудың актамдылығы.

Мамандардың жұмысын талдай отырып, біз электрондық ресурстарды пайдаланудың бірқатар маңызды кемшіліктерін бөліп көрсетеміз:

1) оқу процесінің ақпараттық қанығу мүмкіндігі;

2) Ф.Л.Ратнердің пікірінше, оқу процесінің технологиясы артық индивидуализмнің қалыптасуына, демек, жеке тұлғаның тұтастығын бұзуға ықпал етеді. Интернеттегі тұрақты жұмыс тұлғаның ақпараттық қауіпсіздігі мәселесінің туындауына ықпал етеді;

3) жаңа ЭБЖ талаптарына сәйкес келетін заманауи техниканы сатып алу проблемасы;

4) ЭОР құнын оңтайландыру мәселесі;

5) қосымша когнитивті жүктеменің пайда болуы. Когнитивті жүктеме деп пайдаланушыға мақсатқа жету үшін қажет ақыл-ой жадының мөлшері түсініледі. И.Г.Захарованың пікірінше, өзара байланысты web-беттермен жұмыс параллель әрекеттер сериясын орындауды қамтиды: біріншіден, студент оқылған материалды игеруі керек; екіншіден, бір гиперсілтемеден екіншісіне ауысқан кезде логикалық пайымдау тізбегін есте сақтау керек. Нәтижесінде шешілетін мәселенің контексті кеңейеді [4];

6) жоғарыда айтылғандарға сүйене отырып, когнитивті жүктеме ақпараттың дұрыс құрылымдалмауы нәтижесінде пайда болады деген қорытынды жасауға болады. Қате жерлерде гиперсілтемелердің көптігі жағымсыз салдарға алып келеді, нәтижесінде пайдаланушы білім беру траекториясынан ауытқуы мүмкін. Осылайша, ЭОР-ны қолданудың келесі мәселесі туындайды: Эргономика тұрғысынан ақпаратты құрылымдау;

7)ЭОР (Л. П. Мартиросян, А.В.Осин, Ю.А.Прозорова, И.В.Роберт) пайдалана отырып оқытуды жүргізуге қабілетті кадрларды даярлау проблемасы;

8) авторлық құқық мәселесі;

9) оқытудың психологиялық-педагогикалық мақсаттарын іске асыру кезінде ақпараттық ортада теориялық дағдыларды әзірлеу проблемасы[5].

Сонымен, қорытындылай келе, мынаны айтуға болады: ақпараттық қоғамның қалыптасуына байланысты электрондық білім беру ресурстары оқу процесінің ажырамас бөлігі болып табылады. Ақпараттық құзыреттіліктің дамуына ықпал ете отырып, еңбек нарығында бәсекеге қабілетті тұлғаның қалыптасуына ықпал етеді. Дәстүрлі оқыту құралдарының алдында қосымша инновациялық қасиеттерге ие бола отырып, оқушылардың дербес білім беру қызметінің маңыздылығын арттырады; пайдалану мен түзетулер енгізудің салыстырмалы қолжетімділігіне ие; оқытушылар құрамының шығармашылық белсенділігін ынталандырады. Оқытудың осы құралының артықшылықтарын жан-жақты дәлелдеуге қарамастан, біріншіден, "оқу материалын қабылдау мен игерудің төмендеуіне" ықпал ететін оқу процесінің мүмкін болатын қанықтылығы туралы ұмытпау керек (Фунг Куок Вьет); екіншіден, материалдың сапасы күмәнді Интернет желісінде еркін таралуы туралы. Осылайша, дәстүрлі және электронды оқыту құралдарын кешенді пайдалану біртұтас білім беру траекториясын қалыптастыруға, демек, қажетті нәтижеге қол жеткізуге көмектеседі.

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Philological sciences

CHALLENGES IN CONTEMPORARY TRANSLATION

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Keywords: communication, interpreters. source-language , descriptive words, a target language ,simultaneously ,consecutively, conventions, reproducible.

Many years ago, according to the Bible, all people living on the Earth spoke the same language. As they had had a great desire to reach the God, they began building a very high tower to be closer to him. The God decided to punish them and one morning when they woke up they were speaking the different languages and could not understand each other. Since that very time people have been needing interpreters. Functionally, an interpreter is a person who converts a source language to a target language. The interpreter's function is conveying every semantic element (tone and register) and every intention and feeling of the message that the source-language speaker is directing to the target-language listeners. Language interpreting or interpretation is the intellectual activity of facilitating oral and sign-language communication, either simultaneously or consecutively, between two or more users of different languages. Functionally, interpreting and interpretation are the descriptive words for the activity. In professional practice interpreting denotes the act of facilitating communication from one language form into its equivalent, or approximate equivalent, in another language form. Interpretation denotes the actual product of this work, that is, the message as thus rendered into speech, sign language, writing, non-manual signals, or other language form. This important distinction is observed to avoid confusion. Peter Trent, a senator from Westmont, Canada was sure that: "To think that you can be an interpreter only because you know two languages is the same to think that you can play the piano only because you have two hands". Each interpreter must know foreign languages very well and of course he must know theory of translation, because it is impossible to translate perfectly without knowing the main basic aspects of the theory of translations. It has a very interesting history, and was widely developed in the XX century. This century is often called a century of great discoveries, development and progress. Business relations among people, different kinds of communications lead to intensive development of the theory of translation in the XX century.

Translation and interpreting Translation is the interpreting of the meaning of a text and the subsequent production of an equivalent text, likewise called a "translation", that communicates the same message in another language. The text to be translated is called the "the source text", and the language that it is to be translated into is called the "target language"; the final product is sometimes called the "target text". Translation must take into account constraints that include context, the rules of grammar of the two languages, their writing conventions, and their idioms. A common misconception is that there exists a simple word-for-word correspondence between any two languages, and that translation is a straightforward mechanical process; such a word-for-word translation, however, cannot take into account context, grammar, conventions, and idioms. Translation is fraught with the potential for "spilling over" of idioms and usages from one language into the other, since both languages coexist within the translator's mind.

Such spilling over easily produce linguistic hybrids such as "Franglais" (French-English), "Spanglish" (Spanish-English), "Poglish" (Polish-English). On the other hand, inter-linguistic spillages have also served the useful purpose of importing calques and loanwords from a source language into a target language that had previously lacked a

concept or a convenient expression for the concept. Translators and interpreters have thus played an important role in the evolution of cultures. The art of translation is as old as written

literature. With the advent of computers, attempts have been made to computerize or otherwise automate the translation of natural language texts (machine translation) or to use computers as an aid to translation (computer-assisted translation).

The latin “translatio” derives from the perfect passive participle, “translatum”, of “transferre” The modern Romance, Germanic and Slavic European languages have generally formed their own equivalent terms for this concept after the Latin model – after “transferre” or after the kindred “traducere” (“to bring across” or “to lead across”). Additionally, the Greek term for “translation”, “metaphrasis” (“a speaking across”), has supplied English with “metaphrase” (a “literal translation”, or “word-for-word” translation) – as contrasted with “paraphrase” (“a saying in other words”, from the Greek “paraphrasis”). “Metaphrase” corresponds, in one of the more recent terminologies, to “formal equivalence”, and “paraphrase”, to “dynamic equivalence”. Newcomers to translation sometimes proceed as if translation were an exact science – as if consistent, one to one correlations existed between the words and phrases of different languages, rendering translations fixed and identically reproducible, much as in cryptography. Such novices may assume that all that is needed to translate a text is to “encode” and “decode” equivalents between the two languages, using a translation dictionary as the “codebook”. On the contrary, such a fixed relationship would only exist were a new language synthesized and simultaneously matched to a pre-existing language's scopes of meaning, etymologies, and lexical ecological niches. If the new language were subsequently to take on a life apart from such cryptographic use, each word would spontaneously begin to assume new shades of meaning and cast off

previous associations, thereby vitiating any such artificial synchronization. Henceforth translation would require the disciplines in this article. Another common misconception is that anyone who can speak a second language will make a good translator. In the translation community, it is generally accepted that the best translations are produced by persons who are translating into their own native languages, as it is rare for someone who has learned a second language to have total fluency in that language.

Another problem for translation is related to the lack of understanding of a foreign culture, because a language is not just a collection of words. The roots of language go deep into culture. Therefore, in order to avoid misunderstanding, the translator can offer his own commentary, outlining the meaning of certain customs.

Computer translation was invented to facilitate the process, but due to the lack of imagery and completeness of the statement, it cannot take a dominant place.

The translation process should be approached creatively. The literal translation should not interrupt the meaning of the context. Of particular difficulty is the translation of technical texts.

In this case, knowledge of terminology is inevitable.

Requirements for the accuracy of translation have increased significantly. If the translators of fiction allowed all sorts of liberties, then this, at worst, led to a distorted idea of the author's creative style and the literary merits of the work. However, distortions in technical, commercial, diplomatic translation can have much more serious consequences. Therefore, free translation in such areas is recognized as completely unacceptable. The translator constantly has to decide what elements of content can be sacrificed in order to more accurately convey other more important details. [eleven]

the main component of which is linguistic flair. The ability to listen and hear, to perceive sounds and intonation, to distinguish them, to be able to reproduce them, to have a fine command of the language, to be able to convey the specifics of the style of the translated text, the ability to notice the features of a foreign language in comparison with the native one. The translator is distinguished by an interest in the theory and history of a foreign language, the culture of the people of the language being studied. [eleven]

Modern trends force us to be more attentive to the translation of advertising texts due to the psychological impact on the mass audience. When translating an advertisement, it is necessary to accurately convey the actual data with an exhaustive meaning that is understandable to the audience.

A good translator understands the source language well, has specific experience in the subject matter of the text, and is a good writer in the target language. Moreover, he is not only bilingual but

bicultural. It has been debated whether translation is art or craft. Literary translators, such as Gregory Rabassa in "If this be treason", argue that translation is an art – a teachable one. Other translators, mostly technical, commercial, and legal, regard their "metier" as a craft – again, a teachable one, subject to linguistic analysis, that benefits from academic study. As with other human activities, the distinction between art and craft may be largely a matter of degree. Even a document which appears simple, e.g. a product brochure, requires a certain level of linguistic skill that goes beyond mere technical terminology. Any material used for marketing purposes reflects on the company that produces the product and the brochure. The best translations are obtained through the combined application of good technical-terminology skills and good writing skills. Translation has served as a writing school for many prominent writers. Translators, including the early modern European translators of the Bible, in the course of their work have shaped the very languages into which they have translated. They have acted as bridges for conveying knowledge and ideas between cultures and civilizations. Along with ideas, they have imported, into their own languages, loanwords and calques of grammatical structures, idioms and vocabulary from the source language. Interpreting, or "interpretation", is the intellectual activity that consists of facilitating oral or sign-language communication, either simultaneously or consecutively, between two or among three or more speakers who are not speaking, or signing, the same language. The words "interpreting" and "interpretation" both can be

used to refer to this activity; the word "interpreting" is commonly used in the profession and in the translation-studies field to avoid confusion with other meanings of the word "interpretation". Not all languages employ, as English does, two separate words to denote the activities of written and live-communication (oral or sign-language) translators.

Even English does not always make the distinction, frequently using "translation" as a synonym of "interpretation", especially in nontechnical usage. Interpreting has been in exsistence ever since man has used the spoken word. It has therefore always played a vital role in the relationships between people of different origins since the beginning of mankind. However, there is a lack of hard evidence pinpointing the time of the creation of interpreting due to the fact that interpreting, unlike written translations, leaves behind no written proof. The first written proof of interpreting dates back to 3000 BC, at which time the Ancient Egyptians had a hieroglyphic signifying "interpreter". The next widely known use of interpreting occurred in Ancient Greece and Rome. For both the Ancient Greeks and Romans, learning the language of the people that they conquered was considered very undignified. Along with commerce, however, the Arabs introduced Islam to the Africans, and Arabic, the language of the Koran, became ever more important. Interpreters assisted in spreading the word of the Koran to the local villages. Another religion that has always yearned to explaned its borders is Christianity. In 1253, William of Rubruck was sent by Louis IX on an expedition into Asia accompained by interpreters. This was one of the very first large-scale pure mission trips: William's sole purpose was to spread the word of God. Another factor that played a large role in the advancement of interpreting was the Age of Exploration. With so many expeditions to explore new lands, people were bound to come across others who spoke a different language. One of the most famous interpreters in history came out of the Age of Exploration, specifically the early 16th century. This interpreter was of Mexican descent, and served Cortes on his crusades. Her name was Dona Marina, also known as "La Malinche". La Malinche serves as good example of the feelings held toward interpreters in the Age of Exploration. Because the interpreters that helped the conquerors were often of native descent, their own people often felt that they were traitors, regardless of the circumstance and whether or not they were interpreting voluntarily. On the other hand, however, these people served as a connection between the native population and the explorers. The explorers therefore treasured these go-betweens. Furthermore, interpreters enabled many pacts and treaties to occur that otherwise would not have been possible; they have played a large role in the formation of the world that we know today.

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PECULIARITIES OF INTERCULTURAL COMMUNICATION IN TOURISM INDUSTRY

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Abstract

This article deals with the peculiarities of intercultural communication and its importance in the process of training future tourism professionals. Intercultural communication allows tourism professionals to establish contacts and develop effective relationships with people from different cultures. In the design and development of a tourism product, the planning and execution of advertising and exposition activities, and the organization of foreign visitor reception and service on the territory of the host ethnocultural or multicultural community, intercultural communication principles should be applied.

Анотація

У статті розглядаються особливості міжкультурної комунікації та її значення в процесі підготовки майбутніх фахівців туризму. Міжкультурна комунікація дозволяє фахівцям з туризму встановлювати контакти та розвивати ефективні стосунки з представниками різних культур. При проектуванні та розробці туристичного продукту, плануванні та проведенні рекламно-експозиційної діяльності, організації прийому та обслуговування іноземних відвідувачів на території приймаючої етнокультурної чи полікультурної громади слід застосовувати принципи міжкультурної комунікації.

Keywords: intercultural communication, tourism professionals, tourism product

Ключові слова: міжкультурна комунікація, професіонали туризму, туристичний продукт

Introduction. Recent advancements concerning Ukraine's candidacy for EU membership have emphasized the importance of reconsidering the role of intercultural communicative competence in English for special purposes (ESP) training. ESP has been chosen as a research problem because the number of young people in Ukraine who use English to interact professionally is increasing constantly.

Globalization and Ukraine’s membership in the EU will raise the demand for all types of specialists who can communicate in English. In today's international job market, a cultural approach to teaching ESP is of vital importance. Cultural studies within ESP provide opportunities to overcome cultural barriers and avoid misunderstandings that may occur when a “consumer” of one culture perceives and evaluates the facts, actions, body language, and words of a person who comes from another culture. People definitely have different languages and customs, but modern specialists, especially those who are trained to work in the sphere of the tourism industry, must be prepared to deal with customers from different cultures. As a result, developing the future tourism professionals’ international communication skills in languages, particularly ESP, is critical today.

The main part. Tourism can be viewed from two perspectives in modern times: leisure as a form of relief and business or volunteer lines. Ukraine is entering a new level of communication in the global community with the expansion of the information space and the strengthening of business and personal contacts. Awareness of a state’s belonging to the world requires the achievement of mutual understanding between the speakers of different cultures. This will contribute to the establishment of business relations with partners. As a result, intercultural communication is one of the most important factors in its formation.

The term “intercultural communication” originated in the 1950s. in the USA and is still associated with such scientists: E. Hall, K. Klakhon, A. Kreber, R. Porter, D. Trager. Western

researchers K. Berger, S. Huntington, E. Hirsch, E. Hall, G. Hofstede, and S. Dahl developed theories of intercultural communication. Intercultural dialogue was analyzed by M. Bakhtin and Y. Lotman. A significant contribution to the research of intercultural communication processes was made by Ukrainians – L. Aza, O. Vyshniak, E. Holovakha, V. Stepanenko, B. Slyushchynskyi, N. Kostenko, A. Ruchka and M. Shulga. There is also a certain development in the works of V. Andrushchenko, L. Guberskyi, N. Vysotska, O. Hrytsenko, A. Yermolenko, G. Kasyanova, V. Yevtukha and L. Nagornoi [5].

The term "intercultural communication" was used in E. Hall's (1959) influential book, "The Silent Language", and E. Hall has been generally acknowledged to be the founder of the separate discipline. The researcher used anthropological notions in the practical world of Foreign Service. He broadened the anthropological perspective of culture to include communication. In fact, he defined culture as a communication process.

The term "communication" derives from the Latin word communico, which means "to join or combine", "to link", "to participate in", or "to share with everyone". This root word is related to not just the word "communicate", but also the words "common", "commune, communion", and "community". Thus, we can define communication as the process of sharing ideas or information with others. We often associate communication with talking, yet it encompasses much more than simply words. Other aspects of the voice send signals, as do our eyes, facial emotions, hand gestures, body position, and movement.

Also, according to V. Shcherbina, this "concept can be used both in a broad (universal) and narrow sense. Communication is based on mutual understanding; sharing information from one person to another or several others" [9]. Its component is "intercultural communication, both a science and a set of skills that must be mastered during communication, because interaction with another culture requires certain knowledge and skills, with a focus on the inherited and established social norms of people belonging to different national and ethnic groups communities" [10].

Its efficacy is dependent on whether all participants in this process truly understand each other. A common language does not imply that the interlocutors agree on the topic of conversation. As a result, even among native speakers, misunderstandings might occur.

I. Bakhov used three approaches to study the concept of "intercultural communication". The first approach is based on classical positivist methodology and the concept of structural functionalism, which employs the system method introduced by the information society concept (D. Bell, A. Toffler). The communication ontology in this approach is based on system relationships and functions. The second one (a non-classical methodological approach introduced by Y. Habermas) is based on the cognitive model of subject-object relations, in which the field of communication is singled out as a special ontological object. The study is based on methods of hermeneutic interpretation of meanings, critical reflection, and rational reconstruction. The third (post-non-classical approach) reduces the nature of social relations to subject-object relations, i.e., the principle of intersubjectivity, and excludes objectivity. Society is seen as a network of communications, and communications create an opportunity for the self-description of society and its self-reproduction (N. Luman). Communication is considered an active, self-organizing environment [1].

Modern researchers are developing the concept of intercultural communication in two directions: communication and interaction among cultures from different countries and peoples, and interaction among subcultures within one broad culture. The first is concerned with the creation of university programs. The second aims to examine problems of ethnic minority coexistence and affirm cultural plurality.

In the middle of 1990s, ideas of intercultural communication began to emerge in Ukraine. Initially, they were connected with a change in the paradigm of teaching foreign languages. Language skills and abilities, as well as cultural skills and competencies, are essential for the effective creation of intercultural interactions. Thus, the following principles of intercultural communication have been higlighted:

1. Intercultural communication and interaction are based on an understanding of cultural differences.

2. Intercultural communication is unsuccessful when:

a) an attack is made on the system of values accepted in another person's culture;

b) national feelings are touched;

c) national dignity is humiliated.

Humiliation of national feelings and national dignity is manifested in the form of prejudices, stereotypes, and discrimination that pose a great threat to the further continuation and development of intercultural communication. Therefore, showing respect for and interest in the culture of the people and a positive assessment of the prospects for its development is the basis for effective intercultural communication.

3. It is critical to focus on the future rather than the past while participating in intercultural communication. Of course, remembering the past, the history of one's own and foreign peoples', their culture, art, literature, and the history of relationships between them is vital when establishing intercultural dialogue, but the future prospects should prevail.

4. The goal of intercultural communication is to respect one's own cultural interests while also respecting the partner's cultural interests. [5].

In accordance with the above, intercultural communication has a multifaceted character, which reveals its integrative nature, and the content is based on the integration of the three most important components (language that reflects the culture of the people; culture, which conveys the peculiarities of social and historical conditions; the personality that is formed in the course of educational and social activities).

Intercultural communication takes place in international relations, entrepreneurial, scientific, and educational activities. Accordingly, its objects are world regions, ethnic and national cultures, ethnic and social groups, as well as individuals. Thus, it takes place at the ethnic, regional, national, and civilizational levels. [5].

Intercultural communication in tourism is implemented in three ways: the activity itself (interaction between representatives of different cultures in the process of professional tourism); the organizational principle (during the development and enhancement of the tourist product, marketing communications development, advertising planning and implementation related to the accommodation and service of foreign guests); and the tourist product factor and quality criterion. All of these factors are implemented in Ternopil through the tourism manager, tour guide, representatives of accommodation and food establishments, local government, and business.

“A tourism manager is a person who organizes the process of providing services through management, control, and coordination in order to achieve the best results and set goals” [11].

Thus, the development of a creative, tolerant, and communicative personality is the goal of the process of training a tourism manager.However, it should be noted that the standards for the application of intercultural communication knowledge vary for different specialists in the tourism industry. For example, marketing specialists, specialists in tourism advertising and public relations, tour guides, translators, and entertainment specialists are required to meet the highest standards.Their intercultural competency, including cognitive awareness, authenticity, and depiction of the most significant intercultural events, determines the quality of the tourist product (common to both cultures). [11].

The following types of intercultural competences should be highlighted:

1) analytical: understanding of values, beliefs, practices, and paradoxes of another culture and society, including ethnic and political understanding; ability to establish connections; awareness of the conditions of otherness;

2) emotional: the ability to relate to (empathize with) various cultural experiences and influences, as well as an interest in and respect for other cultures, values, traditions, and experiences-cultural empathy across borders;creative – realizing the synthesis of cultures, seeing alternatives of various options, the ability to use different cultural sources for optimistic inspiration;

3) behavioral: not only language skills but also the ability to work as a translator; free use of intercultural non-verbal codes (naturalness); the ability to avoid communicative misunderstandings

with different communication styles; the ability to maintain interpersonal relationships; responses to transnational challenges; globalization pressure (unification, migration) [2].

Communication is the main key to any activity. Thanks to it, communication takes place between specialists in the tourism sector and tourists themselves, and the possession of basic competences in conducting a dialogue is the main stage in successful mutual understanding.

Therefore, the tour guide, "a specialist under whose leadership the inspection of objects is carried out and whose narration and comments correspond to a certain topic and contribute to the achievement of the task defined by the technological tour map" [8], tries to implement them during the performance of his tour duties.

According to statistics provided by the mobile provider Kyivstar, the number of international visitors visiting Ukraine, and particularly Ternopil, varies from year to year (Table 1). Through their communication, the management and tour guides have developed the capacity to "see and hear" the visitor (excursionist), that is, the ability to understand the foreign tourist and the ability to accept his viewpoint. It is important to understand that the employees in the field of hospitality are the face of the city. The city's reputation depends on their professional skills and their ability to interact with customers. Specialists in the field of tourism help visitors learn about the surrounding world and fascinate them by helping them perceive the reality that surrounds them using visual and semantic impressions that do not always coincide with their personal ideas.

Table. 1.

Statistics of tourists in Ternopil from the Kyivstar mobile operator

	2017 year	**2018 year**	**2019 year**	**2020 year**	**2021 year**
Number of domestic tourists	486 406	818 479	995 892	259 828	512 417
Number of oreign tourists	24 188	28 471	37 560	4 569	13 875
Together	510 594	846 950	1 033 452	264 397	526 292

Most of the people come to Ternopil from Russia, Belarus, Poland, Germany, the Czech Republic, France, Italy, England, India, the USA, and England for the purpose of partnership negotiations, visiting relatives, training or competitions, etc. Thus, four tour guides who speak English, German, and Italian have been trained to perform excursions for foreigners in Tourist information centre in Ternopil, Ukraine. At the request of tourists from these countries, a series of themed itineraries and excursions have been developed that emphasize the connection between Ternopil and the country of the tourists' residence. In addition, promotional materials (in English, Polish, and German) have been prepared for more convenient communication: tourist guide cards, excursion menus, fliers "First time in Ternopil" and "Selfie locations", etc. It should also not be overlooked that in the city, mostly in the central part, in restaurants, English-language menus have been introduced, which facilitate communication between the service staff and the visitor, and in accommodation facilities, mainly hotels, the price list can be found in English as well.

To avoid conflict situations or misunderstandings, specialists pay attention to cultural features characteristic of the language culture of tourists when creating advertising materials, developing tour texts, and filling out websites. After all, excursion materials intended for local tourists should differ from those aimed at attracting foreign guests. The same approach is applied to the content of commercial articles and advertisements, web pages, and materials about tourist fairs and exhibitions designed for representatives of different language cultures [7].

In addition to leisure tourism, business tourism is developed in Ternopil, which since 2021 has gained greater importance for Ukrainians. Thanks to the volunteer missions from the twin cities, the number of foreigners in the city increased, as did the direction of partnership relations. Therefore, for successful negotiations and the signing of agreements, knowing the language and possessing the competencies listed above are not enough; you also need to pay attention to non-verbal signals, regardless of the fact that verbal components of communication make up a significant part of communication. Unintentional misunderstandings and disputes can occur when cultures interact owing to variances in the verbal and nonverbal codes of speakers from other cultures. [**4**]. In this

respect, newly-trained professionals in the tourism industry should pay attention to their manner of communication and be restrained. In addition, they should avoid proverbs, sayings, slang, jargon, and jokes in their own language in order not to create curiosities. If there are ambiguous words, then it is worth explaining them in more detail in order to make sure that there is an understanding between the interlocutors. To avoid these misunderstandings in business discussions, it is vital to focus on the primary sources of communication conflicts:

1) individual characteristics of communicators;
2) social (interpersonal) relations;
3) organizational relations.

Personal causes of conflict, according to A. Delhes, include strong influence and favoritism, typical individual needs, low ability or readiness to adapt, forced anger, incommunicado, capitivism, a thirst for power, or a complete lack of knowledge. People with such qualities often cause conflicts. Among the common causes of conflicts are unfounded competition, insufficient recognition of abilities, and insufficient support or readiness for compromises that guarantee goals and measures for their achievement. Organizational causes of conflicts include work overload, no clear competences or responsibilities, ensuring one goal, continuous changes in rules and regulations for different types of communication, and deep changes in entrenched positions and fields [5].

In addition, the emotional state of the representatives of the tourism business plays an important role during communication. Objects of contemplation, which are associated with events, names, or dates, and tour guides or business partners, also cause active emotions, but here the principle of dosage must be followed. In many ways, the level of emotionality of tourists or partners (enthusiasm or, on the contrary, indifference, pride, disappointment, or pity) depends on how satisfied they are with the information received about certain objects or materials [8].

It is also important to note that for visitors to the city, it is generally worthwhile to include the things that serve as our region's business cards. Furthermore, for better comprehension, parallels, similarities, and analogies should be presented in these cards in relevance to the visitors' region. It is not necessary to record a large number of numbers, names, and dates for a foreign visitor; just the most significant ones are required. Because of the large number of architectural structures included in the excursion route, it is more acceptable to substitute the precise age of building construction with an indicator of centuries or decades. When organizing religious tours, it is worth remembering that "religion as a form of social consciousness and worldview includes two interrelated and at the same time independent levels: psychology and ideology".

Religious psychology is a set of believers' ideas, feelings, moods, customs, and traditions related to a certain system of religious ideas. Religious ideology is a system of ideas developed by religious organizations, professional theologians, and cult ministers. Relying on their help, it is possible to reveal the essence of theology, theological concepts, religious philosophy, and provide a systematic presentation of religious views on the world, man in it, and the meaning of his existence.

Therefore, intercultural communication is "adequate mutual understanding between two participants in a communicative act who belong to different cultures" [4]. Thanks to it, tourism specialists interact with foreign tourists during their activities. However, it consists not only in the possession of communicative abilities at the international level (knowledge of foreign languages), but also in familiarization with the peculiarities of religion, customs, culture, and history, folk food traditions, and the presence of a high culture of behavior and tolerance.

Thus, the analysis of the current state of development of the readiness of tourism specialists in Ternopil for intercultural interaction makes it possible to believe that, against the background of the overall positive picture, there are a number of problems and shortcomings in the training of tourism managers for intercultural communication. In order to increase the level of intercultural training of future specialists, it is necessary to pay attention to the development of tolerance and socio-cultural communication knowledge and skills [6]. After all, in the near future we will see a large influx of tourists who will be interested in visiting Ukraine, in particular Ternopil, not only with a volunteer mission but also to relax.

Successful intercultural communication involves a person's constant readiness to perceive, understand, and accept other people's ethnic stereotypes of behavior, people's customs, interests, cultural values, etc. Therefore, nowadays society needs not just specialists but workers who are able to adapt to the conditions of the modern labor market, where it is necessary not only to master the language but also to know the laws, customs, and national mentality of the country with which communication is conducted.

Conclusion. Thus, intercultural communication is an important component in the training of tourism specialists since it allows for the establishment of contacts and the development of effective relationships with people from different cultures. It represents not just the desire for cultural unification, but also the necessity to preserve cultural distinctiveness. In the design and development of a tourism product, the planning and execution of advertising and exposition activities, and the organization of foreign visitor reception and service on the territory of the host ethnocultural or multicultural community, intercultural communication principles should be applied.

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THE PROBLEM OF LINGUISTIC PERSONALITY IN MODERN LINGUISTICS

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ПРОБЛЕМА ЯЗЫКОВОЙ ЛИЧНОСТИ В СОВРЕМЕННОМ ЯЗЫКОЗНАНИИ

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Abstract

The article discusses the theory of linguistic personality in linguistics. In modern science, it is given that linguistics, in connection with the social spheres of knowledge, increasingly integrates the concept of personality and creates its complex picture. As for the linguistic personality as a category of linguistics, it is noted that this concept, as well as directly related linguistic phenomena, is actively used in research and, as a consequence, in the practical activities of many fields of knowledge.

Аннотация

В статье рассматривается теория языковой личности в языкознании. В современной науке дается, что языкознание в связи с социальными сферами знания все больше интегрирует понятие личности и создает ее комплексную картину. Что касается языковой личности как категории языкознания, то отмечается, что это понятие, как и непосредственно связанные с ней языковые явления, активно используется в исследованиях и, как следствие, практической деятельности многих областей знаний.

Keywords: linguistics, linguistic personality, anthropocentrism, psycholinguistics, sociolinguistics.

Ключевые слова: лингвистика, языковая личность, антропоцентризм, психолингвистика, социолингвистика.

Теория языковой личности в языкознании с момента своего появления вызвала значительный интерес у лингвистов.

Ученый Ю.Н. Караулов, являясь основателем этой теории [1], является активным сторонником и одновременно одним из сторонников антропоцентрического подхода к изучению языка. В этой связи можно привести известный вывод ученого Ф. Де Соссюра о том, что «за каждым текстом стоит одна языковая система». С позиции антропоцентризма в языкознании ученый сформулировал этот лозунг несколько иначе: «за каждым текстом стоит языковая личность» [2, 3-5.].

Это утверждение хорошо характеризует ситуацию в общей лингвистике: на протяжении нескольких десятилетий изучение человеческого фактора в языке не теряло своей актуальности. В связи с этим существенно важно взаимодействие языкознания с другими социальными науками: психологией, социологией, философией, политологией, педагогикой.

Ученый Б. Момынова в работе «новые направления и типичные отношения в языке» отмечает, что человек – это личность, не просто совокупный образ добра и противоречий, но и личность, воплощающая в себе национальные и социальные черты. Поэтому этнолингвистика, этнопсихология, этнопедагогика, психолингвистика, лингвокультурология, когнитивная лингвистика – все они исследуют сознание и познание человека, его глубокие складки, результаты познания и сознания, мысли и мышления через язык» [3, 85].

Бодуэн де Куртенэ также отмечал факт «ментальной, центральной мозговой» основы языка: «все, что связано с человеческим языком, как языком, сосредоточено в мозге. Бездушная речь может быть машиной, но не человеком, а мышлением и социальным, но

предметом мышления и общества являются необходимые условия конкретного языка» [4, 212]. По его мнению, психическое развитие человека возможно только в общении, так как язык может быть реализован только в обществе, поэтому лингвопсихология является языковой личностно-социологической наукой [4, 217].

В настоящее время мы все больше убеждены, что ученый положительно отзывается. Почти столетие спустя, в двадцатом веке, появляются такие науки, как психолингвистика, социолингвистика, что означает прямую, неразрывную связь областей знаний с лингвистикой и, следовательно, представляет центральный объект их исследования – человека, владеющего языком и использующего его.

В современной науке лингвистика все больше объединяет понятие личности в связи с социальными сферами знания, создавая ее многогранный образ. Что касается языковой личности как категории языкознания, то следует отметить, что данное понятие, как и непосредственно связанные с ним языковые явления, активно используется в научно-исследовательской и, как следствие, практической деятельности многих областей знаний.

Например, в научном исследовании в области философии в ходе языковой деятельности и научной практики выявлена динамическая связь субъективности и дискурса человека. При этом формирование дискурса трактуется как процесс нормирования мышления и деятельности [5].

Можно заметить, что в последнее время сформировалась тенденция приходить к интерпретации языковой личности в нескольких направлениях:

1. определить основные системы формирования личности, являющейся языковой личностью (род, среда обитания, литературное и языковое, национально-культурное влияние и др.);

2. показать особенности, отражающие личностные качества личности,составляющие языковую идентичность личности, т. е. способность к самообразованию, самосовершенствованию, воспитанию, осознанию личной ответственности за наследование своего языкового опыта потомкам, овладению знаниями, овладению умениями, использованию приобретенных знаний и опыта для изменения действительности и т.д. установлено, что в качестве сложного, многоступенчатого объекта исследования, состоящего из свойств, необходимо рассматривать уровневый анализ, заключающийся в описании ассоциативно-вербального, лингвоковитивного, прагматического уровней его языка [6, 14-15].

Обратимся к мнениям ученого Ж.А. Манкеевой о важности раскрытия национальной идентичности на указанных уровнях: «проявление развития указанных уровней в той или иной языковой личности проявляется в разной степени и носит разный характер. Его творческое познавательное содержание состоит из системы мировоззренческих, культурных ценностей. Поэтому мы понимаем языковую личность прежде всего как национальную языковую личность. Потому что природа языковой личности напрямую связана с национально-культурной стадией личности", - [7, 281-284].

В научных работах по культурологии прослеживается взаимодействие языка и культуры. В частности, в одной из таких работ предлагается единая концепция языковой картины мира национального языка; приводится соотношение научной картины и языковой картины мира. Характерной особенностью такого исследования является то, что оно проводилось на материалах трех языков, в частности, путем изучения их лексико-фразеологической языковой системы личности, на основе которой было доказано соответствие лексико-фразеологической языковой системы языка статусу национальной языковой картины мира [8].

В педагогике актуальными являются научные направления, рассматривающие становление языковой личности в условиях современного полиязычного образования; осуществляющие признание языковой личности феноменом культуры и развивающие технологию воспитания языковой личности в процессе преподавания отдельных дисциплин [9]; работы, обосновывающие модели развития языковой личности [10].

Исследователь в области психологии предложил три уровня процесса развития психотерапевта как языковой личности; в целом, в психологии языковой личности обоснован

теоретический языковой личностно-методологический статус проблемы языковой личности [11]. Данная постановка проблемы раскрывает перспективу дальнейшего развития проблемы языковой личности с точки зрения психических процессов, обусловливающих деятельность человека в психологии языковой личности. В лингвистике, в частности, среди научных работ по психологии, определяющих прямую корреляцию с понятиями, используемыми в исследовании языковой личности, можно выделить исследование, направленное на выявление роли языковой картины мира в политической коммуникации; вместе с тем, определены психологические личностные факторы формирования политической картины мира общества и детерминанты политического выбора; и приоритет вербального уровня, влияющий на формирование политической картины мира между уровнями коммуникации будет научно обоснованным [12].

По мнению С.Г. Агаповой, «проблема активизации языкового опыта личности тесно связана с анализом общих проблем человека, основ его существования, духовного развития, интеллектуальных, эмоциональных, интуитивных, нравственных, эстетических проявлений [13, 12]. "Ни одна наука не существует сама по себе и для себя, ее развитие зависит от практических потребностей общества» [13].

После появления в лингвистике теории языковой личности Ю.Н.Караулова стало ясно, что это понятие, по мнению Е.В. Красильниковой, уже существует в трудах многих ученых и что "существуют области, экспликация которых стала внутренней потребностью" [14, 8]. Например, Ю.Н. Караулов В.В. В работах Виноградова отмечается возникновение этого феномена, который в своих работах раскрывает сущность "художественно-языкового сознания" при описании языка писателей таким образом, труд Ю.Н. Караулова «Русский язык и языковая личность» открывает лингвистическому миру такой новый и в той или иной степени знакомый объект, как языковая личность, и не только русский следует отметить, что и другие языки предлагали исследователям широкую сферу деятельности.

Сразу после появления в лингвистической литературе теории Караулова актуальность проблемы языковой личности в лингвистике и интерес к ней исследователей обусловили появление ряда работ, посвященных данной проблеме лингвистики и затрагивающих различные аспекты ее изучения. Так, например, одним из первых опытов в описании языковой личности является ряд исследований речевого портрета А.А. Реформатского. Е.В. Красильникова описывает эти работы как «первый опыт целостного описания языковой личности» [14, 10]. Исследования проведено несколькими авторами – учениками Реформатского, которые, объединяясь, представляют собой комплексное исследование языковой личности и охватывают различные стороны ее речевого творчества в зависимости от принадлежности к различным социальным ролям (М.А. Реформатская, Р.И. Лихтман, В.И. Постовалова, С.Е. Никитина и др.).

К числу первых исследований в языкознании, непосредственно характеризующих языковую личность, можно отнести работы, характеризующие ее различные типы, т. е. речевые портреты носителей языка различных стратификационных слоев общества (Р.Ф. Пауфошима, О.Б. Сиротинина, Т.В.Ларкина, Н.Б. Можаева, А.И. Девятайкин и др.); Исследования показывают, что языковая личность рассматривается как категория, относящаяся к определенной социальной группе и в связи с этим отражает специфику речевого поведения в связи с такой принадлежностью (Л.З. Подберезкина, Е.Ю.Кукушкина, Л.А. Капанадзе) [2]. В частности, Л.П. Крысин рассматривает такие группы, как "малые социальные общности", и дает характеристику типам этих групп и их личностным качествам, по его мнению: структура, однородность речи, диглоссизм (в некоторых случаях полиглоссизм или его элементы), групповые образцы речи, а также некоторые особенности при внутригрупповом общении устная речь [15, 78-86].

Изучение индивидуальных особенностей языка личности (произношение, интонация, словоупотребление), таких как когнитивные процессы при формировании речи (оценивание и самооценка, языковое сознание и самосознание) в тесном взаимодействии с прагматической стороной речи (в частности, проблемы построения и развития речевой стратегии

«говорящего»), отсутствие актуальности и проблемы построения и развития речевой стратегии. Первоначальное применение результатов исследований языковой личности на практике в конце 80-х-начале 90-х годов прошлого века свидетельствует об исключительной значимости таких исследований и, на наш взгляд, подчеркивает многогранность, многогранность подходов к его рассмотрению для любого объекта научного исследования.

Это свойство языковой личности как лингвистического понятия связано с ее способностью приобретать практическую значимость не только в области науки.

Таким образом, феномен языковой личности появляется в новом качестве, а именно становится объектом различных областей изучения человеческой деятельности с развитием и интеграцией научного знания.

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Philosophical sciences

THE SPIRITUALITY OF THE GREAT STEPPE: FROM AL-FARABI TO ABAI

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Abstract

It is known that XX century gave birth to the famous figures . From this point of view , an outstanding Kazakh scientist, one of the founders of the Kazakh National Academy of Sciences ,the first correspondent members and first introduced the world the great scientist of the East, Al-Farabi.Studying Al-Farabi is one of the most urgent issues today . To search the world of Al-Farabi and recognize the wisdom of Abay were special: no matter what last work the teacher does for the people, he would build a new page of science. During his research could rely on: the value of Kazakh language , scientific Islamic way and the seven pillars of nature today . Especially the legacy from al-Farabi should be recognized and mastered according these three principles.They undoubtedly will give al-Mashani's creativity a vital quality and pass it on from generation to generation.

Keywords: Kazakh philosophy, Al-Farabi and Abai, humanity, education.

Kazakhstan during 30 years,its independence is filling with quite significant achievement, like political, economic, social and cultural changes. Such a phenomenon was characteristic of science. The science of domestic history was supplemented with fresh data which based on written works.

If we look at any period of our history, there are people who became intellectuals, educated people who served their people, selected representatives of the national elite. The reason is that our people consider a person who is rich in spiritual world higher than a person who is materially rich and respects him. There were not a few very wealthy and rich people in Kazakh, but only a few of their names have been preserved in our history. And the names and creations of the great representatives of speech art (and clay art) were forever preserved in the country's memory and passed down from generation to generation.

If we summarize the history and destiny of the national idea in Soviet Kazakhstan in one word, it is the suffering and persecution of nationalistic individuals, it is the fact that Kazakhs in their own country, in their own land, are turning away from the Kazakhs due to the forcefully imposed political-ideological slogans and delusions. In Kazakhstan during the Soviet years, there was no national idea that dominated the minds and hearts of Kazakhs. Individuals who loved the nation and understood the horror of the disaster that was coming from the socialist experiments burned and drowned for the language, religion, culture and land of their native people, but the totalitarian system, which dripped blood from its sword, was not able to create a national idea. The national idea that determines the fate of Kazakh, who has achieved freedom thanks to the great personalities which worried about their nationality.

No matter which of the great personalities passed without touching about their nationality. Their greatness must be in their own creation. The legacy of our former poets reflects the Kazakh-Kalmyk, Kazakh-shurshit, Kazakh-Russian invasion Wars, relations between Khan and Kara, the twentieth century began with works that revealed the traditions built by the great Abai – bad and good, the dispute of Education, Science and ignorance, the contradictions of useful and harmful phenomena for the fate of the nation, awakened the consciousness of the country and called it to the heights of

civilization. "We have come to the point of writing a general history of the Kazakh intelligentsia," academician M. K. Kozybayev wrote.To do this, we need to educate a young generation of historians who are engaged in the history of the intelligentsia". [1, p. 7]

One of the most pressing issues that have not yet fully formed our scientific understanding and have not received a true assessment is the history of our National People. From this point of view, the study and promotion of the heritage of the outstanding Kazakh scientist Al-Mashani Akzhan Zhaksybekovich, one of the cornerstones of the Kazakh National Academy of Sciences and one of the first corresponding members, who first studied and showed the world the Great Scientist of the East Al-Farabi, , is undoubtedly one of the most pressing issues today.

Akzhan Zhaksybekuly was a tireless researcher of the subsoil. He is a dedicated researcher and publicist. Akzhan Mashanov came to the field of mining and geology during the terrible war years. He started his first steps as a mining engineer and geologist, and he was able to distinguish himself as a scientist who left a significant mark on the path of science.

His scientific outlook was not limited to geology and mining sciences. He is the founder of the school of geomechanics in Kazakhstan, one of the most important scientific directions of mining science. In turn, he is a unique person who laid the foundation for the study of the scientific heritage of the great thinker of the East, Abu-Nasir al-Farabi.

Akzhan grew up learning and memorizing the poems of Abay and Shakarim. Akzhan's grandfather, Mashan, was probably determined authority of the elder sultans of Kunanbai and Zhamantay in Karkaraly. And Kunanbai and Mashan became contemporaries who were in-laws and got along very well. This relationship was preserved until the time of Abai Shakarim. Akzhan Zhaksybekuly did not write a dissertation on Abay, but in 1943, on the 100th anniversary of the great sage Abai, on the direct order of K. Satbaev, Akzhan Zhaksybekuly gave a speech on the topic "The manifestations of natural science in Abai's works". He wished that the technical scientist's speech about the genius poet would be meaningful and deep before the audience. Akan justified the high hopes.

In this regard A.Akzhan said: "If we had not studied Abai and received training, would we have mentioned al-Farabi... I consider Abai's works to be the ones that gave us the direction to search for the truth" (al-Farabi and Abai, Orken, 17.06.1989). When Akzhan reached his nineties, he returned to the subject of Abai and “summarized the work of al-Farabi and Abai (1994)" about two great ancestors. The spiritual and scientific connection between two ancestors is spreading. This is a work that renews the concepts needed by the generation, reveals a new meaning and aims to grow.

There is no doubt that the names of two wise sons of Kazakh people will be a spiritual support for us. They are: the first - al-Farabi, the second - Abay. Akzhan al-Mashani was directly involved in researching the scientific heritage of both these two people.

It can be said that two different streams of Islam were formed in Kazakhstan during the Abai period. One of them is ghaqli Islam, directed from al-Farabi - Ulykbek - Marjani; the second is the Islamic Islam, which is directed from al-Ghazali - Bakirghani - Sofi Aldiyar.

In Kazakhstan, in the direction of Abai, there was a way to keep these two side by side. The Abai way is the way of the convergence of Islamic-Gaqli Islam, or the convergence of science, wisdom, and a strong heart.This is the place where Al-Farabi met Abay when he returned to his country.

Akzhan's thoughts on "Abai triplets" also interest the student. It is found in the works of Plato and Navai, our al-Farabi started with three-pointed geometry, the beginning of three-pointed is in the Qur'an, and in Kazakh there are phrases like Courage, Mind, and Heart come together in three spheres. Akzhan calculated all that. "The universe is measured for man, man is measured for the universe, and there is a perfect structural correspondence between them" says the scientist. "Love man, love God's wisdom. "What's interesting except life" as our poet Abay said, reminding the wonderful secrets of the universe and showing that he is a small atom of the great universe. [2] "If you don't say it, the father of the word will die", it is necessary to tell the edge of a Kazakh truth. For the first time, Akzhan al-Mashani took a handful of soil from Bab al-Saghir cemetery and brought it to his birthplace. [3]

Akzhan al-Mashani is our patriot, who glorified the power and strength of the state language by creating a technical dictionary and writing textbooks in his native language in the 40s of the 20th century. He is also the founder of scientific journalism in the Kazakh language. Where necessary, he will put in a pattern from a poem.

He proved by his deeds that it is impossible to train qualified specialists before teaching the knowledge to young people in an understandable language and absorbing it into their minds. He took the initiative and translated the textbooks in the field of geology into the Kazakh language for young people who graduated from the village school in Kazakh language. While translating them, he felt that he had the opportunity to write scientific works in his native language. He promoted the need to create a dictionary of scientific names while helping to produce educational literature published in the Kazakh language on astronomy, mining surveying, metallurgy and other fields of science. A. Mashanov's textbook is in great demand among students and pupils of the faculties of mining and geology, which started teaching in the state language.

It is clear that the scientist, who worked hard for the future of his native country and worked for the truth, is pure in the eyes of both his people and his descendants. Because he was very concerned not only in the field of his profession, but also in the upbringing of a generation that could not only add a huge field of thought to the development of ta-ken. He left behind a rich legacy, without dropping a pen from his hands until he reached the top of ninty. When the communist ideology dominated and atheism he openly said that the role of Islam was special, and for that he was persecuted. The dream of A. Mashanov who sacrificed his life to sow the seeds of faith in the minds of the young generation, is being fulfilled today. Even if has not in mass yet, our youth are turning to faith and are moving; they are going to the mosque, fasted and prayed... [4]

Islam is the religion of the end, the religion of the end times, the religion of the time when science has reached its peak. In Islam, science and religion are one thing... That is why our sages like al-Farabi have done great work for the cause of Islam. But it's all deeply. It is important to pay attention to Abay's philosophical thought, "Truth is deep in religion." Yes, Abay said, "God himself is true, and his word is true." Islam is a "scientific religion" in its essence. Our rulers like al-Farabi and Abay bowed before Islam. Al-Farabi has many works that did not fit into the field of Greek scientists, developed the scientific and religious basis of Islam. He wrote them based on the verses of the Qur'an and hadiths of the Prophet.

It should be noted that Al-Mashani provides many such proofs in a very clear manner. Our task, he says, is to purify the paths of honesty and wisdom of the old East, Islam. Development. If we firmly recognize our lineage and direct our spiritual and cultural activities accordingly, we will open the ancient storehouse of Turan and renew the black house.

Kazakh youth should strive for education, only education. ...In order to hold the independence of state, one must be educated. And I entrusted reading of the holy book of the Quran - the channel of all science, the peak of great singing. Islam is the purest, scientific religion. Faith and virtue grow from respect for religion. The fire of truth that burns the face of falsehood is also in the religion of Islam. I believe that the future life of our descendants who value the religion cherished and turn to faith will be better". [5]

It is the honorable duty of our youth today to leave this faith of our grandfather Akzhan. The word of God is that I will find a new source of strength and gather energy from the Holy Quran. If there are those among us who go astray, looking at each religion, each of us should guide them, teach them, and look after the heritage of our ancestors. Because all human life with humanity and education lies in faith and goodness.

Akzhan Mashanov was a premature son. His genius is clearly visible in his behavior, his attitude towards science and life.

"No matter what work Akzhan Mashanov undertakes for the people, he built a new path and opened a new page of science, the sacred language of Kazakh, the scientific Islamic path and the achievements of natural science to this day are supported by his power," says one of the scientist's students - Shamshidin Abdirahman. [6]

The proverbs of our wise people: "A good person is a treasure" has a deep meaning. This proverb was said to great personalities like A. Mashanov. If we look at the rich scientific heritage of our grandfather, we can see a very rich and meaningful complex of life. A. Mashanov left an indelible legacy to the younger generation. His name will remain in the memory of the people forever .

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Physical sciences

WHY THE PHYSICS TEXTBOOKS TEACH AN INCORRECT VERSION OF THE SPECIAL THEORY OF RELATIVITY WHICH DENIES THE EXISTENCE OF RADIO- AND ELECTRICAL ENGINEERING

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Abstract

The article states that the existing version of the special theory of relativity (STR) is incorrect, since relativistic formulas obtained therein are incorrect; they have been incorrectly explained by using the incorrect principle of speed of light non-exceedance and entailed wrong conclusions about physical unreality of imaginary numbers and existence of only our visible universe. It mentions experimental evidence of the foregoing, obtained by the author within study of transient and resonant processes in linear electric circuits. It is shown that the existing version of the STR implies conclusions on nonexistence of tsunami and bell ringing, piano music and swinging children's swings, as well as many other real processes. It is also shown that the existing version of the STR denies even the possibility of existence of radio- and electrical engineering. Therefore, it is concluded that existing university physics textbooks should be corrected.

Keywords: Special theory of relativity, physical reality of imaginary numbers, theory of linear electrical circuits, radio engineering, electrical engineering.

1. Introduction

The special theory of relativity is now presented for study in all university physics textbooks and its creation by Joseph Larmor [1], Nobel Prize winner Hendrik Anton Lorenz [2], Jules Henri Poincaré [3], Nobel Prize winner Albert Einstein [4] and other prominent scientists is rightfully considered the greatest achievement of physics of the 20th century. However, its creation stopped halfway due to the lack of necessary experimental knowledge at that time and the inability of its authors to correctly explain the relativistic formulas obtained in STR. They did not know how to explain that according to these formulas all the results of calculations at superluminal velocities turned out to be imaginary numbers discovered by Scipione del Ferro, Niccolò Fontana Tartaglia, Gerolamo Cardano, Lodovico Ferrari and Rafael Bombelli [5] 400 years ago. It is also possible that Paolo Valmes [6] was even first to make the scientific discovery, for which he was burned by the sentence of Spanish inquisitor Thomas de Torquemada. But it was necessary to explain these formulas, because a theory that even its authors could not explain would be of no use to anyone. Therefore, a postulate called the principle of light speed non-exceedance was introduced into the STR. The postulate implied that a situation at superluminal velocities might be unexplained, as people would never face it. Consequently, a belief that imaginary numbers were physically unreal turned out to be possible. Thus, relativistic formulas appeared to be explainable.

It was convenient, but unproven and, as it turned out later, incorrect. But in this form, the generally accepted version of the STR was studied in all university physics textbooks. And it is still studied today.

However, this postulate was refuted by the discovery of Cherenkov radiation [7], for which Pavel Alekseyevich Cherenkov, Igor Evgenyevich Tamm and Ilya Mikhailovich Frank received the Nobel Prize in 1958. And at that time the generally accepted version of STR was saved by specification that the principle of non-exceeding the speed of light refers to the speed of light only in a vacuum. But by numerous experiments [8]-[23] performed in the 21st century it was proved that such corrected formulation of the principle of non-exceeding the speed of light is also incorrect. As it turned out, this

formulation was refuted by the existence of natural phenomena known from time immemorial - tsunami, bell ringing, music created by pianos and even swinging after pushing by parents children swings, which the authors of STR at its creation did not take into account. This formulation was also refuted by the existence of radio- and electrical engineering.

As a result by all these experiments and the mentioned natural phenomena a very important general scientific principle of physical reality of imaginary (and consequently also complex and hyper-complex) numbers by which the really existing huge and still completely unknown to the modern science world is described was proved. And the use of the principle of physical reality of imaginary numbers as applied to the universally accepted version of STR allowed us to conclude that the relativistic formulas obtained in this version are wrong in general, because at hyperluminal speeds they correspond to an unstable, i.e. instantly self-destructive, physical world.

What is the most surprising is that, despite all the aforementioned sensational experimental refutations[1] [24]-[44], the incorrect version of the STR has still been groundlessly believed to be correct and studied in all university physics textbooks, as well as naturally used by physicists in their fruitless scientific research - for example, in attempts to understand what is dark matter and dark energy while performing research at the Large Hadron Collider. It is completely unclear why a single disproving experiment is enough to refute other hypotheses and theories in physics and other sciences, whereas the existing version of the STR turned out to be irrefutable despite all the experimental and theoretical proofs of its falsity. Moreover, in the USSR even three times in 1934, in 1942 and in 1964 by the decisions of the Central Committee of the All-Union Communist Party (Bolsheviks) and the Presidium of the Academy of Sciences of the USSR, which have not yet been canceled, it was generally forbidden to criticize this theory. That's why the question raised in the article title is very important and ways and rates of further science development would depend on answer thereto.

Further, we will try to answer this question.

2. From STR it follows that radio engineering and electrical engineering should not exist in nature

And we will make this attempt on the example of one more refutation of the generally accepted version of STR. On the assertion that STR on the one hand and radio engineering (and electrical engineering too) on the other hand mutually refute each other [45]-[54]. But since there can be no doubt about the existence of radio engineering and electrical engineering, it is obvious that then the existing interpretation of SRT is incorrect.

But do the STR and radio engineering actually refute each other? Let's check it out. Let's look at the arguments of SRT. It follows from the fundamental principle of the STR on light speed non-exceedance that imaginary numbers[2] have no real physical content. In other words, objects and phenomena described using imaginary numbers do not exist. This expressly follows from the version of the STR set forth in all university physics textbooks. And neither authors of the textbooks nor anyone else can still explain what, for example, 5i meters, 200i grams or 300i meters, where $i = \sqrt{-1}$ is, whereas everyone knows what 5 meters, 200 grams or 300 meters is. That's why the principle of light speed non-exceedance used in the STR has caused no objections.

However back in 1893 Charles Proteus Steinmetz (original name Karl August Rudolf Steinmetz) offered, as applied to linear AC circuits, his interpretation[3] of Ohm's law, discovered by Ohm in 1826 as applied to DC circuits. According to his theory, called a linear circuit symbolic

[1] *Which, in contrast to the widely publicized unsuccessful OPERA experiment, were quite reliable and, having been done before the OPERA experiment, made it unnecessary*

[2] *Naturally, it makes sense to talk about the physical reality of imaginary numbers, as well as real numbers, only in relation to named numbers, equipped with indications of the units used for the corresponding parameters of physical objects and processes.*

[3] *On which he made a presentation at the International Electrical Congress and, in addition, in the proceedings of the American Institute of Electrical Engineers published an article "Complex quantities and their use in electrical engineering."*

analysis method, not only resistors, but also capacitors and inductors have resistance referred to in Ohm's law. Herewith, resistance of resistors R is measured by real numbers, and resistance of capacitors C and inductors L is measured by imaginary numbers $j\omega L$ and $-j/\omega C$, where $j=\sqrt{-1}$ is the so-called imaginary unit[4], and ω is the frequency of applied voltage. But in accordance with the principle of light speed non-exceedance their resistances do not actually exist, just as on the same basis in accordance with the STR there are no relativistic mass, time and length at superluminal velocities. They are even called imaginary resistances in the theory of electric circuits.

Consequently, real electrical resistance of any LCR - circuit must always be determined only by resistors R included in this circuit and be measured by real numbers. Therefore, the current flowing through such an electrical circuit should not depend on the value of the frequency of the applied voltage.This means that there could be no resonance in such electric circuits, and electrical filters could not be created. For this reason, existence of radio engineering and electrical engineering is also completely impossible.

3. However, it follows from the existence of radio engineering and electrical engineering that the version of SRT studied in all physics textbooks is incorrect

Now, let us come to think of it.

There is no doubt that nature is one and the laws of nature are also one. Always and everywhere. Be it on Earth, or in the depth of space, or in the microcosm, or in animate or in inanimate nature. However, people, due to their limited intellectual capacity, are able to absorb only a very small part of this knowledge. Norbert Wiener wrote in this regard: "Important researches sometimes delayed by the unavailability in one field of results that may have already become classical in the next field"

That was what happened in physics in the 20th century.

Physical reality of imaginary numbers unknown in physics to this day had been known in radio engineering even before the STR was created. Moreover, there are other sciences that use imaginary numbers besides physics. Unlike physics that has still had no idea of physical interpretation of relativistic formulas of the STR at superluminal velocities (therefore, the principle of light speed non-exceedance proved to be in demand in the STR), radio engineering textbooks perfectly explain the use of imaginary numbers.

In 1826, when there had been no electrical measuring equipment, Georg Simon Ohm discovered a law applicable to DC circuits. The law was named after him [55], [56]. And in 1893 Charles Proteus Steinmetz proposed his interpretation of Ohm's law in respect to linear AC circuits [57],

Now millions of engineers all over the world use it daily in their practice. According to the symbolic electric circuit analysis method proposed by him, resistance of any LCR-circuit would be measured by complex numbers whose values depend on frequency of voltage applied to an electric circuit.

This makes it possible to carry out a very simple and comprehensible experiment that answers the question whether imaginary numbers are physically real. And all we need for this is to change the frequency applied to a considered LCR-circuit and once again measure the value of current flowing in it. If the value of current does not change, resistances of capacitors and inductors included in the circuit are actually imaginary by its physical nature. And if the value of current changes, then these resistances are imaginary only in name and since they are measurable, they are actually existent. After all, most of what we know about the world around us, we have learned in physics, biology, chemistry and all other sciences particularly with the help of measuring devices. And if we learnt about the world around us directly with the help of our senses and trusted only them, there would be no science.

All engineers who have ever held a soldering iron in their hands know that resistance of LCR-circuits always depends on frequency of voltage applied to them. This dependence is called the frequency response. For many decades, the industry has even mass-produced devices for measuring frequency responses (see fig.1).

[4] *In the theory of electric circuits the imaginary unit is commonly denoted by the letter j, whereas the letter i denotes electric current.*

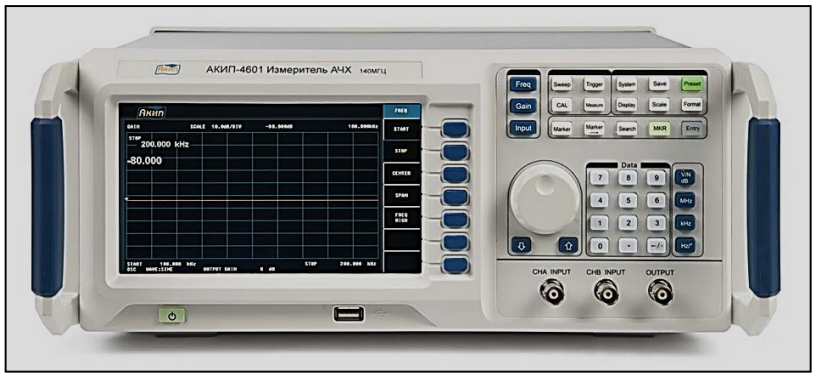

Fig. 1. *Fig. 1. In any radio engineering laboratory there are devices (one of them is shown in the figure), called frequency response meters, which by their very existence prove the physical reality of imaginary numbers. Thus they prove the incorrectness of the existing version of SRT, and the OPERA and ICARUS experiments at the Large Hadron Collider made it unnecessary*

Thus, radio engineering undoubtedly proves physical reality of imaginary numbers and thereby refutes the principle of light speed non-exceedance, and, consequently, the version of the STR presented in all university textbooks of physics.

4. Why did the existing version of STR turn out to be irrefutable?

Despite all the refutations mentioned above, the version of the STR set forth in modern textbooks continues to dominate in physics and is studied even in the most prestigious universities. And involuntarily the question "why?" arises. Why is it that in other sciences one experiment that refutes them is enough for the corresponding hypothesis or theory to cease to exist? .And in physics, SRT, in spite of everything, turned out to be irrefutable. Why did the existing version of STR turn out to be irrefutable?

The answer to this question is obvious - because this version of SRT is in demand. But this answer raises another question - by whom and why is it in demand? And the answer to it is also simple - by relativistic physicists and for career reasons. But it's not entirely obvious.

Then let us remember. At the beginning of the 20th century, the STR was met with hostility. Nobody understood and accepted it, since scientists had previously carried out their research based on classical physics, which even now is much more requested than relativistic physics. However, the STR overcame general scepticism of physics community and began to be studied in textbooks. Now history repeats itself. For more than 100 years of its existence, many studies have been done, many theses have been defended, many articles and books have been published, and many physicists have created their careers on the basis of the STR. Many physicists-relativists have headed academic departments and journal editorial offices. Considering that there is no antimonopoly law in science, but rather competition, physicists have naturally begun to use their position to stifle scientific dissent. Sir Karl Raimund Popper [58] wrote: *"... Struggle of opinions in scientific theories is inevitable and is a necessary prerequisite for the development of science."*

Therefore, in order to answer the question posed in the title of the article, it is necessary to take into account the psychological aspect of the problem of competition in science, which is actually a kind of business. Hans Christian Andersen's fairy tale "The Emperor's New Clothes" perfectly illustrates the paradoxical nature of the solution of this problem in STR. It is clear from the tale that the indisputability of the existing version of the (essentially incorrect) STR was achieved by taking the problem of its existence beyond the bounds of common sense. The same way in Andersen's fairy tale, in which knavish tailors suggested to the king that he make clothes invisible to the unwise courtiers and visible to the wise courtiers, thereby creating a situation beyond common sense in which:

- courtiers, in order for the king to consider them smart, began to pretend that they see the king's clothes that do not actually exist;
- courtiers who would like to tell the truth about emperor's non-existent clothes knew in advance that they would be regarded stupid;

• thus, the situation forced courtiers to tell a lie for career reasons, and thereby contribute to the successful activities of the swindlers.

And as shown in the monograph of the Nobel Prize winner Sir Roger Penrose "The New Mind of the King" [59], which is an allusion to Andersen's fairy tale, quite recently in computer science it was similarly argued about the inevitability of the emergence of a computer civilization [60]-[64], which over time supposed to enslave people. This witty reception of Sir Penrose was so effective that now no one remembers the possible enslavement of people by computers.

And in the situation considered in the article:

• the physical community now recognizes as “smart” those scientists who understand (and at first no one understood and accepted STR) the generally accepted version of STR and believe it to be unconditionally correct, despite the fact that it is refuted by many well-known physical realities;

• and these “smart” scientists even deliberately created – for example, by the OPERA and ICARUS experiments – an incorrect public opinion about the infallibility of the existing version of STR presented in university physics textbooks, which justified their unsuccessful long-term multi-billion dollar costs for the implementation of erroneous scientific concepts;

• at the same time, scientists who try to criticize the generally accepted version of STR, the physical community creates a dubious reputation and difficulties in creative activity.

Thus, from the set forth it follows that the universally accepted version of STR stated in physics textbooks, as it is incorrect, it is quite possible to call on terminology H. H. Andersen's "New King's Delusion". And in fact this new theory is as non-existent as the king's non-existent new dress. But the physical community, ignoring the physical realities refuting this version of STR, as well as the "clever" courtiers in Andersen's fairy tale praises it. And it is even studied in physics textbooks. Nevertheless, as Hans Christian Andersen argued, "the king is naked" and so the generally accepted version of the STR in physics textbooks must be corrected.

5. Conlusions

Therefore it is time to realize that, despite the great significance for science of the principle of relativism, this principle, due to the lack of the necessary experimental knowledge in the 20th century in the generally accepted version of STR, was incorrectly stated using the incorrect postulate about non-exceeding the speed of light, that replaced this knowledge. And over the past century since creation of this obsolete version of the STR, physics community has canonized it, instead of correcting and developing it further using the alternative version of the STR created in the 21st century [65]-[69]. But Albert Einstein himself does not claim that his version of STO is infallible. He wrote: *"There is no idea in which I am confident that it will stand the test of time”*

Therefore, the conclusion is logical: modern higher physical education is imperfect, because now even in the most prestigious universities students are still being taught knowledge that has already been refuted by modern science.

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Technical sciences

INVESTIGATION OF NITRIFICATION AND TOXICATION PROCESSES IN SMALL EUTROPHIC ECOSYSTEMS STREAMS OF URBANIZED AREAS

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Currently, waters in urbanized areas are exposed to the greatest man-made impacts as they absorb wastewater from industrial plants, suburban farms and utilities, as well as untreated rain water conduits from industrial sites in cities and rural settlements. These effluents have a high degree of contamination with biological elements and compounds toxic to water ions. As a result of the neutralization of water bodies ecosystems in urbanized areas, it is characterized by significant toxicity of non-biological components and low self-cleaning ability. Loss of self-cleaning ability leads to poisoning and deterioration of these ecosystems. Thus, maintaining the ability to self-purify of waters is a global challenge in modern society to ensure the proper quality of life and health of the population [1-2].

Water self-purification is mainly determined by the type of pollutants, the level of their concentration in the abiotic components of ecosystems, their toxicity to hydrobionts, the function of microbiocenosis, filter hydrobionts, as well as hydrological and climatic conditions.

The purpose of the study was: 1) to study the level of water pollution by compounds of biogenic elements, to assess the trophicity of the watercourse ecosystem by the ratio of concentrations of mineral forms of nitrogen and phosphorus, to develop criteria for choosing a priority water pollutant of eutrophic water bodies in order to study self-purification processes on it; 2) study the processes of self-purification in streams contaminated with ammonium nitrogen in full-scale and model experiments.

The object of the study is the Big Almatinka River, from which water samples were taken in three alignments (Table). Analysis of sources of pollution of ecosystem streams suggests that the priority contaminants of the stream will be compounds of biogenic elements.

Table

Content of nitrate ions in the water of the Big Almatinka River

	W	**exes**
Alignment 1 in Ile-Alatau National Park	class 2	i o
Alignment 2 on the borders of Bostandyk and Auezov districts	class 2	nitrite anion – 0,222 mg/dm^3.
Alignment 3 in the Alatau district	class 2	nitrite anion – 0,162 mg/dm^3.

The permissible concentration of nitrites in surface water ranges from 0.001 to 0.01 milligrams per 1 m^3. The table shows that the concentration of anion nitrite exceeds the background class, but does not exceed the MPC.

In general, as follows from the data, the content of all forms of mineral nitrogen increases from source to mouth. However, in the reservoir, the concentration of all forms of nitrogen decreases markedly, which is associated with significant water dilution. In all study years, the greatest level of excess of background class in the stream is observed for anion nitrite.

The spatial dynamics of contamination with compounds of biogenic elements also indicates a violation of the self-cleaning ability of the aquatic ecosystem, which seems to be associated with a significant excess of the rate of entry of pollutants from the catchment, the rate of their transformation by the aquatic ecosystem and the suppression of microbiocenosis by toxic substances of various origins.

Since self-cleaning processes in eutrophic waters depend on the nature of the priority pollutant that determines the nature of self-cleaning processes, criteria have been developed for the selection of this substance [3].

The following criteria are proposed to select a priority water body pollutant:

1. contribution to the value of WPI more than 25%;
2. toxicity of the substance for hydrobionts;
3. transformation in a water body with the formation of toxic products;
4. the possibility of substance intake both from anthropogenic sources and due to intrawater-intensive processes;
5. contribution of the pollutant to the trophic status of the water body.

The ammonium ion largely meets the above criteria, since its concentration in the waters of the river varies from 2 to 11 MPC; ammonium salts are toxic for many hydrobionts. When they are converted under aerobic conditions, more toxic nitriciums and nitrosamines are formed; they can be formed in the ecosystem due to the processes of ammonization of nitrogenous organic compounds, as well as under anaerobic conditions in soil sediments.

Since the main pollutant of the ecosystem of the river Big Almatinka is ammonium nitrogen, the study of nitrification processes was relevant as one of the factors in the self-purification of the ecosystem from ammonium ions, both in field observations and in model experiments.

To study the effect of various substances on the nitrification process, laboratory experiments were carried out with natural water to simulate the nitrification process. The essence of the model was to create an environment as close as possible to natural, in laboratory conditions, but taking into account the introduction of different doses of the studied substances into the same amount of natural water. Under the influence of the nitrifying microbiota contained in natural waters, the ammonium salt was converted into nitrites and nitrates.

River water samples were taken for model testing. Place of sampling - Sairan reservoir. The choice of the sampling site is due to the lowest water pollution with ammonium salts compared to other parts of the watercourse. Sampling was carried out from a depth of 0.7 - 1 m, then in the laboratory water was poured into vessels in 3-liter vessels each.

After the water temperature coincided with room temperature, different doses of the test components were administered to the samples.

The intensity of nitrification processes was assessed by the degree of ammonium conversion (CD):

$$CD = (C_i - C_f) \setminus Ci * 100\%, \text{ where}$$

C_i - concentration of ammonium nitrogen in the model solution immediately after ammonium dose introduction, mg/dm^3;

C_f - concentration of ammonium nitrogen in the model solution after N days of exposure, mg/dm^3.

The dependence of the degree of conversion (CD) of ammonium nitrogen on its concentration is shown in fig. 1.

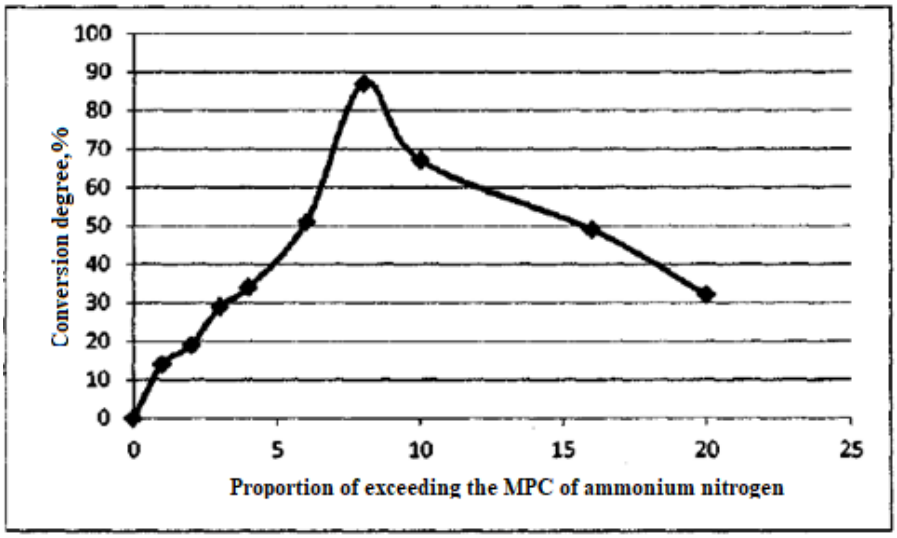

Figure 1. Dependence of ammonium nitrogen conversion degree on its concentration in the system

The dependence curve of CD on the dose of ammonium has a convex shape with well-defined optimal zones and stress zones. The first part of the curve, which characterizes the processes of nitrification in vessels 1–5, which corresponds to ammonium concentrations from 0 to 6 MPC, demonstrates a tendency to increase in the intensity of nitrification with an increase in the content of ammonium nitrogen in the model solution. The function maximum falls on the sixth vessel, which corresponds to an ammonium nitrogen concentration of 8 MPC. With this content of ammonium nitrogen, the sales rate is 87%. In the section of the curve equal to 8-10 MPC, a strong inhibition of the nitrification process occurs, and at an ammonium nitrogen content of 10-20 MPC, the inhibition of the process is less strong, which is probably due to the adaptation of nitrifying bacteria to ammonium salts.

Based on the data of this model, it can be concluded that the most intensive nitrification processes occur at ammonium concentrations of 6-8 MPC. Exceeding this range of concentrations leads to inhibition of microbiota activity and, as a result, to a decrease in the intensity of nitrification processes.

The obtained character of the dose-response reaction can probably be explained by the fact that at ammonium nitrogen concentrations above 8 MPC, nitrification processes are disturbed due to a lack of oxygen in the system.

In eutrophic water bodies, along with nitrogen compounds, compounds of other biogenic elements, such as phosphorus and potassium, are also present in high concentrations. Therefore, it was of interest to study the effect of potassium compounds and phosphate ions on nitrification processes in model experiments.

To study the effect of potassium on the processes of nitrification, a series of model experiments was carried out with different doses of potassium: 1 MPC, 2 MPC, 4 MPC. The concentration of ammonium nitrogen in all experiments was equal to 10 MPC, the total duration of exposure was 19 days, the degree of conversion of ammonium nitrogen was assessed daily in all series.

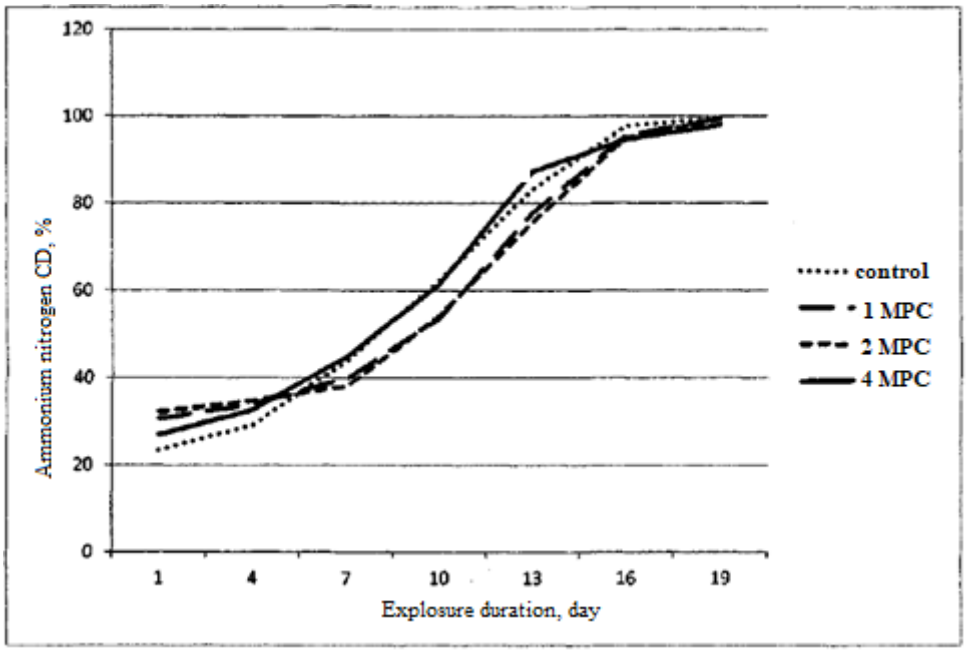

Figure 2. Dependence of ammonium nitrogen conversion on potassium ion concentration

As follows from Fig. 2, potassium has the most noticeable effect on the degree of conversion of ammonium nitrogen in the first four days of exposure, accelerating this process, and the greatest acceleration effect is observed at potassium concentrations of 1 and 2 MPC. From the fifth day of exposure, a slight inhibition of the nitrification process occurs at all concentrations of potassium. Thus, in general, the effect of potassium ions on nitrification processes is less significant.

To study the joint effect on the processes of nitrification of potassium and phosphate ions, solutions of potassium dihydrogen phosphate of various concentrations were introduced into the vessels. The concentration of ammonium nitrogen in all vessels was equal to 10 MPC. The duration of exposure was 20 days.

Figure 3 shows the dependence of the conversion degree (CD) of ammonium nitrogen on the concentration of phosphate ions and potassium.

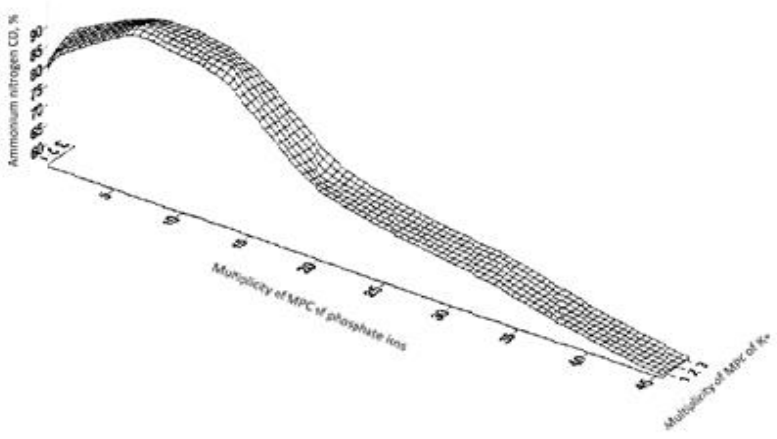

Figure 3. Dependence of ammonium nitrogen conversion degree on the content of potassium and phosphate ions in the system

Figure 4 shows the dependence of ammonium nitrogen CD on the ratio of concentrations (in fractions of MPC) of phosphate ions and potassium in vessels.

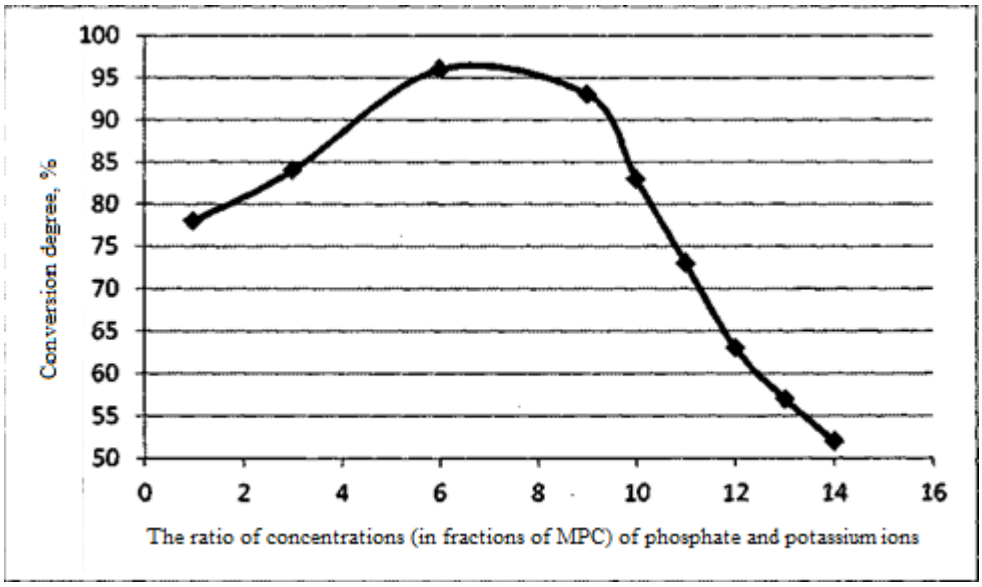

Figure 4. Dependence of ammonium nitrogen conversion degree on the ratio of phosphate and potassium concentrations

Analysis of Figures 3 and 4 shows that the processes of nitrification of phosphate ions are influenced to a greater extent than potassium ions, the highest degree of conversion of ammonium nitrogen in the system is achieved at a ratio of phosphate ion concentrations to potassium ions of 5.8, with a further increase in this ratio, the process of conversion of N_{NH4}^{+} is noticeably inhibited.

Thus, an increase in the level of contamination of watercourse ecosystems with compounds of biogenic elements (PO_4^{3-} and K^+) leads to a decrease in the intensity of nitrification processes, which leads to a slowdown in the processes of self-purification of eutrophic water bodies.

Conclusions.

- The degree of contamination of the waters of the studied watercourse with compounds of biogenic elements was studied, trophic assessment of the watercourse ecosystem was carried out due to the ratio of concentrations of mineral forms of nitrogen and phosphorus. It has been established that in all the studied areas river waters are slightly eutrophied;

- Criteria for choosing a priority water pollutant with nitrates were developed, and self-cleaning processes in the watercourse were studied. It is shown that ammonium nitrogen meets the developed criteria in the studied watercourse, therefore, the weakness of self-purification in this water body is associated with nitrification processes;

- The processes of nitrification in the ecosystem of the reservoir under natural conditions and the influence of various substances in model experiments have been studied.

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ENVIRONMENTAL IMPACT OF FUEL-ENERGY COMPLEX NETWORKS AND MEASURES TO REDUCE IT

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ВОЗДЕЙСТВИЕ СЕТЕЙ ТОПЛИВНО-ЭНЕРГЕТИЧЕСКОГО КОМПЛЕКСА НА ОКРУЖАЮЩУЮ СРЕДУ И МЕРЫ ПО ЕГО СНИЖЕНИЮ

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Abstract

The article deals with the sustainable development of society, which involves the application of the principle of the ecological imperative. This implies such development of the economy that provides a balanced solution to the problems of socio-economic development in the future and the preservation of a favorable state of the natural environment and resource and raw material potential in order to meet the vital needs of the population. At present, the consumption of natural raw materials leads to the formation of a large amount of production and consumption waste.

Аннотация

В статье рассматривается устойчивое развитие общества, предполагающее применение принципа экологического императива. Это подразумевает такое развитие экономики, которое обеспечивает сбалансированное решение задач социально-экономического развития на перспективу и сохранение благоприятного состояния окружающей природной среды и ресурсно-сырьевого потенциала в целях удовлетворения жизненных потребностей населения. В настоящее время потребление природно-сырьевых ресурсов приводит к образованию большого количества отходов производства и потребления.

Keywords: fuel and energy complex, fuel balance, natural resources, solid fuel, resource saving, ecology, modernization.

Ключевые слова: топливно-энергетический комплекс, топливный баланс, природные ресурсы, твёрдое топливо, ресурсосбережение, экология, модернизация.

Introduction

The development of civilization on Earth has always been closely related to the type and amount of energy used. Today, the volume of energy use is expanding so much that its further increase in the future poses a great threat to the development of mankind in the future.

Therefore, since the last decade of the last century, special attention has been paid to the use of environmentally friendly renewable energy sources, primarily solar and wind.

In Uzbekistan, rich in sunny days, strategies for the development of renewable energy sources are being developed. Although the cost of renewable energy technologies is much higher than the cost of traditional energy production technologies, today it is possible to clearly identify the facilities where they are implemented. For Uzbekistan, these are primarily devices designed for low-power facilities of local industry and construction, agricultural facilities and the social sector, farms and greenhouses, and other facilities for generating electricity and heat. Today, the widespread use of renewable energy sources in remote mountainous and semi-desert areas, as well as in pastures, can easily compete with traditional energy sources.

The rapid development of the country's economic sectors leads to an ever-increasing demand for fuel and mineral raw materials, which requires their extraction in large quantities. However, the reduction of high-quality and easily recoverable deposits and the extraction of mineral resources at deep horizons with difficult mining and technical conditions cause economic and environmental problems for mining enterprises. In particular, the issue of ecology, which is one of the problems threatening the whole world, was recognized as a very important head of our state Sh.M. Mirziyoyev in his work “Critical analysis, strict discipline and personal responsibility should be the daily rule of every leader” [1].

The activity of the enterprises of the fuel and energy complex is complex and consists of various production processes that require a comprehensive solution of issues of economic and environmental development. The main attention should be focused on further increasing the positive effect obtained from the implementation of economic, organizational, managerial and environmental programs of enterprises on the basis of a joint system approach. For this reason, substantiation of directions for ensuring the integration of economic and environmental development of enterprises in the fuel and energy complex and the development of its methodology is considered an important scientific issue.

As noted in the assessment of the world energy potential, prepared by the UN Department of Economic and Social Affairs, the energy system has a multifaceted relationship with the economic, environmental and social aspects of the development of individual regions and countries. and the entire world community [2].

Analyzes and results.

The improvement of the fuel and energy system of the countries of the world is a continuous process that involves the consistent implementation of these measures. The improvement can be short-term, but also long-term (the effect of increasing power on certain changes in the environment). But in today's rapidly changing economic, social and environmental aspects, there is a need to change various elements of the energy system for different countries [3].

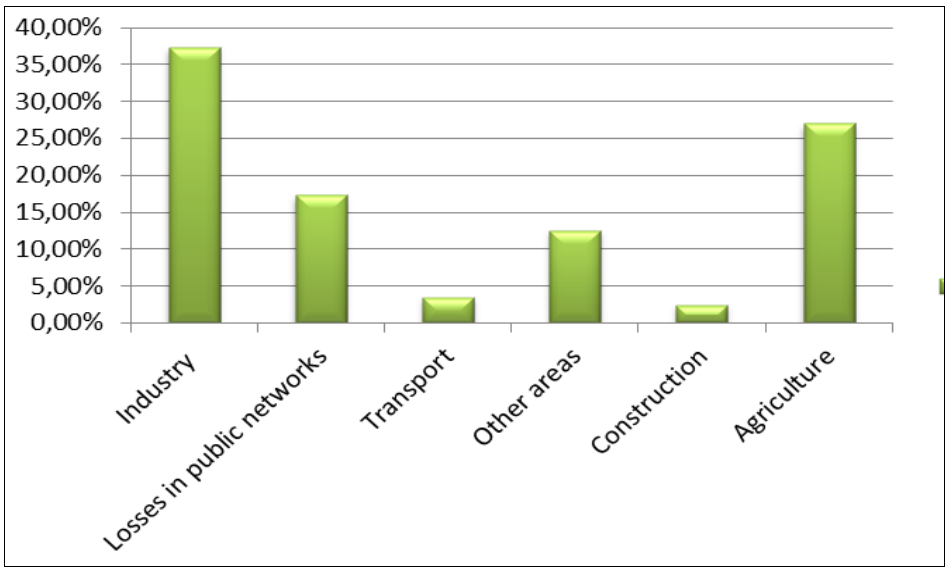

Figure 1. Structure of electricity consumption in Uzbekistan.

At the present stage of development, more than 1 billion tons of harmful substances are released, which indicates insufficient improvement in the technology of processing natural resources and the use of organic raw materials. Emissions of waste and harmful substances are doubling every ten years. As a result, this situation can lead to a violation of the principle of regeneration of nature.

The following main conflicts that determine modern environmental conditions can be distinguished:

- between the pace and goals of socio-economic development and the relative scarcity of natural resources and the deterioration of the natural environment;
- availability of natural resources, variety of conditions and technical means and solutions;
- the level of our knowledge about the use of natural resources and natural processes and their application in technological processes;
- the level of knowledge that reflects the complex problems of the relationship of mankind with the natural environment and the possibility of introducing progressive technologies.

Of course, all countries are interested in solving this problematic situation, because pollution can occur not only through private waste and hazardous substances, but also through border countries, that is, transboundary pollution is also observed.

In the regions of the Republic of Uzbekistan, where industrial sectors are widely developed, the environmental situation remains ambiguous. The level of pollution of atmospheric air, water and soil exceeds the established norms, and the areas of land allocated for waste disposal are increasing.

As a result of increased anthropogenic impact in a number of regions, natural landscapes are changing, and the problem of preserving the biodiversity of animals and plants arises.

The volume of extraction of various minerals today forms the basis of the economy of the Republic of Uzbekistan, and the obsolescence of existing production technologies leads to the loss of valuable natural components in raw materials.

The industries of the fuel and energy complex (hereinafter referred to as the fuel and energy complex), which include the extraction, processing and use of solid fuels, have a great influence on the pollution of the natural environment of Uzbekistan. According to calculations, during the extraction of 1 ton of coal, 20 m^3 of methane-containing substances, 0.25 tons of tailings, 7 tons of overturned rock in the recesses, 2.8 m^3 of wastewater are formed. During the processing of coal, 0.23 tons of enrichment waste is generated, and during combustion - 0.25 tons of ash. [1-9].

The coal industry occupies a significant place in the negative impact on the environment in the fuel and energy industries. This situation is confirmed by the following main reasons that exist in practice:

- firstly, large-scale mining and consumption of multi-ballast coals, that is, coals with a high level of ash content, moisture and waste; the ash content of the mined coal is 40%, the moisture

content is 50%, the waste content is 3%, and the listed coal quality indicators negatively affect the thermal performance of power plants, and also pollute the environment;

▪ secondly, the lack of improvement of existing technologies that ensure the production of environmentally friendly products and the disposal of gaseous and solid wastes, and the insufficient use of new technologies.

In the process of coal mining, together with the main raw material, coal mine methane is extracted and released through vacuum pumping stations and ventilation systems, polluting the natural environment of areas where underground mining takes place.

Toxic components such as ethane, butane, propane and methane are emitted as a result of the release of mixed methane waste into the atmosphere. Reduction or complete reduction of these types of gaseous emissions can be achieved through their use as an energy fuel.

During coal mining, as well as pollution of the natural environment, the discharge of overburden rocks and wastewater is of great importance.

Wastes include sand, silica, gravel, iron oxide, clay and other elements. These wastes can be considered as a potential technological raw material in the production of various products.

At the next stage of technological processes - enrichment of solid fuels, the environment is mainly polluted with solid waste. Energy enterprises account for the main share in air pollution, and their emissions account for 40% of the total emissions.

The main source of pollution when coal is used in power plants is slag and ash containing nitrogen and sulfur oxides.

Table 1 below lists emissions from the combustion of various fuels:

Table 1

Comparative emissions of pollutant components from the combustion of various types of fuel.

No	Pollutant source as fuel type	Pollutant, kg/t			
		Solids	Carbohydrates rods	Nitrous oxide	Sulfur oxide
1	Natural gas	0.05-2	0.03-0.3	5-20	0.01-0.02
2	Motor fuel	2-8	10-40	15-60	1.5-6
3	Fuel	2-4	0.17-1.5	5-20	3-30
4	Coal	1-100	0.1-1.2	5-20	10-90

The production of electricity from gas obtained from coal is characterized by environmental cleanliness and transportation of coal from the place of production to the place of its use by pipeline transport, which reduces the cost of transporting fuel.

The advantages of this transport are that coal is transported in the form of a suspension, which ensures a higher environmental cleanliness at the combustion stage compared to multi-ballast coal.

The advantages of natural gas as an energy resource may change in the near future as the share of coal in the country's fuel and energy balance increases. The correctness of this view is determined by two interrelated situations:

1. Limitation of natural gas reserves;
2. Sufficient supply of solid fuels.

Therefore, this approach allows freeing up natural gas reserves from production for sale on the world market.

The solution to this problem is related to the issues of reconstruction and technical re-equipment of the domestic thermal power industry, the development of the coal industry, energy efficiency and environmental protection. This implies a revision of the fuel balance in the following technical areas:

▪ additional loading of coal-fired thermal power plants;

▪ modernization of power plants designed to operate on coal fuel;

▪ use of advanced energy-efficient technologies for the use of energy fuel;

additional development of electric and thermal power plants operating on new types of improved fuel and raw materials;

use of non-traditional energy sources (for example, solar energy).

The energy potential of alternative energy sources is high. But their widespread use is associated with certain difficulties - a pilot industrial description of technical solutions for the use of non-traditional energy sources and economic limitations.

There are many effective and low-cost examples of the use of such technologies in the world, but their use is estimated by the fact that scientific and technical solutions in this area are expensive (Table 2).

A feature of a sufficient amount of coal and fuel oil is their low quality. In fact, liquid fuel is fuel oil with a high sulfur content.

In every country, the environment is polluted by both internal and external objects. Nitrogen, sulfur oxides and other harmful substances are transferred from one country to another. [1-9] .

Table 2

Different technologies based on electricity energy work produce value.

Electricity harvest do method	**Electricity cost , cents / kWh**
1	*2*
In the corner at work heat up the electricity station	2.0
Wind energy	6.4
Geothermal energy	5.8
Biomass energy	6.3
Steam based working gas turbines	4.8-6.3
Nuclear electricity station	12.5
Photovoltaic sun batteries	28.4

In many countries, the environmental situation remains an urgent problem, despite the implementation of various measures in these areas. According to the World Health Organization, today no country has a normal ecological state. Only Belgium, Japan, USA and Sweden received a score of "4" on a 5-point rating scale. Pollution of the air and land around power plants with incompletely captured ash is determined by the high ash content of burning coal, at which the electrostatic precipitators are not able to capture the ash. Of course, this has an impact on human health and the environment.

As another important harmful factor generated by the use of solid fuels, sulfur compounds emitted into the atmosphere with steam gases from power plants and other energy facilities can be indicated.

Sulfur compounds have a negative effect on the flora. According to the UN, the presence of sulfur dioxide in the amount of 0.1-0.2 mg/m³ reduces plant growth by 10%, in the amount of 0.2-0.5 mg/m³ by 29%, and in the amount of more than 0.5 mg /m³ reduces by 48%.

In order to prevent pollution and reduce damage, many countries have adopted special laws for the protection of the air basin, including the establishment of permissible concentrations of harmful substances in the air (Table 3).

Table 3

Limits of substances allowed in coal-fired power plants in some foreign countries.

State	**Thermal power, thousand kW**	**Year of introduction of the standard**	**Norm, mg/m³**	
			Sulfur com-pounds	**Nitrous oxide**
1	2	3	4	5
Belgium	300 300	1985 1987	250 400	200 650
Denmark	fifty	1984	800	1150
Finland	150	1987	400	200
Italy	100 100	1987 1989	1200 400	650 650
Netherlands	300	1987	850	800

	300	1988	850	500
Great Britain	700	1988	900	650
USA	73	1978	900	740
Germany	300	1984	830	210
Australia	300	1984	900	800

Compliance with permissible pollution standards allows not only to reduce the level of environmental pollution, but also to expand the raw material base for the production of various products - sulfur, sulfuric acid, gypsum and other substances. Thus, in the conditions of today's increase in the pace of industrial development and the constant consumption of the population, the negative impact of TEP on the environment will remain at a high level. The above problems necessitate a single-purpose policy in the field of resource saving in TEP networks, first of all, a policy aimed at saving energy resources and improving their quality.

Conclusion

Thus, based on the above considerations, we can conclude that it is necessary to form economic and environmental options for the development of mining enterprises of fuel and mineral raw materials and the implementation of an economic and mathematical model based on the objective function of minimizing reproduction and social and environmental costs for industrial premises is of practical importance. Therefore, it is expedient to develop methods for introducing integrated economic and environmental systems and evaluating the effectiveness of the use of fuel and mineral raw materials in the activities of mining enterprises.

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ARTIFICIAL INTELLIGENCE - PROS AND CONS

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As stated in the Roadmap for Education for Sustainable Development, technological progress always solves certain problems and gives birth to new ones [1]. In modern business and everyday practice, "artificial intelligence" is understood as software and technological modifications: various directions of "machine intelligence", learning neural networks, "deep learning", etc.

Artificial Intelligence has enormous potential to influence the development of a society striving for sustainable development. If properly harnessed, the potential of AI can dramatically accelerate the achievement of the Sustainable Development Goals set by the United Nations. But at the same time, new challenges - technological, social, ethical and security - are emerging.

The UNESCO report Steering AI and advanced ICTs for Knowledge Societies/A rights, openness, access and multi-stakeholder perspective [2] states that AI can effectively serve the Sustainable Development Goals: increase access to information, provide quality education, contribute to an inclusive society.

At the same time, artificial intelligence is said to have the character of Schumpeter's "creative destruction" [3].

In order to assess the social effects of artificial intelligence, ROAM indicators have been developed, covering the key categories: Human Rights, Openness, Accessibility, Multistakeholder Participation. They cover a wide range of issues: freedom of speech, access to information, privacy protection, digital media, information literacy, the gap between countries in the development of AI, etc. The indicators are recommended for use at the national level to research, evaluate and improve the environment in which AI is developed and used.

The increasing role of artificial intelligence in society has even given birth to a proposal to include the digital environment along with the natural, social and economic environments in the formula for sustainable development, moving from the economy-ecology-society triad to a new configuration.

The Internet in the 21st century is a powerful factor in globalisation, reaching 7 billion people. Failure to take this factor into account, or to use it without regard to national interests, could have long-term negative consequences.

Meanwhile, robotisation can threaten the economic stability of civilisation. It is not just job losses. Robotisation changes the way humans relate to work. The cost of human labour will be so reduced that it is simply unprofitable, because an artificial intelligence performs labour actions many times more efficiently.

Robots will even have to be limited in the speed at which they perform processes in order to synchronise with human physical capabilities. It is not just about routine physical work, but even writing scientific papers, replacing the work of a lawyer, a doctor (diagnostician and surgeon), a manager, etc. The asynchrony will be increasingly evident in the economy as well: between the exponential growth of supercomputer productivity and the linear dynamics of economic growth.

Legal and ethical issues are emerging. For example, questions of responsibility in the use of unmanned cars on city streets, with the possible negative consequences of their use.

Other advantages and disadvantages of using AI cannot be discounted. According to the calculations of V. Glushkov, one of the creators of the Nationwide Automated System of Accounting and Information Processing (OSAS), about 10 billion people would be needed to maintain a well-managed economy without the use of computers in one country alone [4]. Today it has become clear that "machine-less" efforts alone are not enough to govern.

Euphoria about AI should not diminish concerns about its safe use. For example, there have been known cases of automatic false alarms where only the human factor helped to avoid the outbreak of nuclear war. The world must not be defenceless against the mistakes of AI.

There are also concerns about so-called lethal autonomous systems (LAS), which are used in the military sphere (auto-guidance, combat target selection, automatic firing on approaching targets), where decisions are made by the system without operator intervention and the operator cannot or does not have time to override the autonomous system, i.e. human control over the use of force is lost.

In fact, the issue of international legal regulation of AI becomes comparable to the regulation of nuclear weapons and the deterrence of military nuclear use.

Similar legal issues arise over the control of robotic weapons associated with autonomous weapons.

Despite this, the global community is currently witnessing an AI arms race, and a moratorium is still out of the question. That said, China was the only UN Security Council member state to support the drafting of a convention banning LAS in 2019.

Thus, even at the current level of AI implementation, we are on the verge of its transition from object to subject of social legal relations. AI is objectively becoming an end-to-end socio-technological organisational and information technology.

At the highest level there should be prescribed so-called "laws of robotics", providing ethical control, human and humanity safety, in accordance with positive ethical matrix of human [5,6].

The control of AI activities should take place with both human supervision and "controlling AI", aimed at finding possible errors and failures, preventive or emergency response.

The closest functional definition that describes the contours of future reality, but allows instrumental control of this model, is "hypercyclic-surplus trans-boundary" [7]

CONCLUSION

Artificial intelligence technologies are powerful tools for transforming the world. They can help solve the planet's daunting ESG and sustainability challenges. However, to do so, we need to agree on common rules and ethical principles for the application of artificial intelligence, establish global digital cooperation and, of course, continue to improve the technology, remembering that this tool must be used for the common good.

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GENERATE RECOMMENDATIONS PROCESS IN ENTERPROSE SYSTEMS FOR AUDIT OF INFORMATION SECURITY

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Abstract

To ensure a high level of security, every organization should conduct regular information security audits. This process is very costly in terms of time, money and human resources. Automating the audit process by developing software can be a good alternative to reduce costs, speed up the audit process and improve quality by complying with international security standards. In the development of expert systems, there are many issues related to the creation of a knowledge base, the generation of recommendations, the formation of rules, etc. This article is devoted to some issues of building expert systems for information security auditing based on appropriate ontology and architecture. Some examples of generating recommendations related to active information security auditing in organizations are considered.

Keywords: expert systems, information security audit, active audit, generation of recommendations, cyber security.

Introduction

Information security is actively developing through the use of various technologies which can provide the ensuring of the confidentiality, integrity and availability of information. Key criteria for the information security can be described as follows:

- Confidentiality, that is access to information to authorized users only;
- Integrity, as ensuring accuracy and completeness of information and methods of its processing;
- Accessibility as ensuring access to information and associated assets of authorized users as it needed;

We can also specify the other optional categories for security model:

- Non-repudiation as the ability to certify those actions took place or event happened so that these events or actions could later be rejected;
- Accountability as an ensuring access and identification the subject and the registration of its actions;
- Reliability as a property to be consistent with the expected behavior or result;
- Authenticity as a property to ensure that the entity or resource identical stated.

The best solution for providing enough level of information security in organizations may become the process of auditing of the information security. The audit process is highly expensive in terms of time and cost as well as in the degree of involvement of human resources. As an object in the audit of information security is often considered the automated system as a set of personnel involved and automated operations for implementing a particular information technology.

One of the measures to reduce costs and facilitate audits is the use of specific tools, such as checklists and questionnaires, to identify gaps between specific security standards and the organization's existing security practices. ISO checklist 17799 ([1-3]) contains a set of audit questions on the guidelines of the standard ISO. ISO IEC 27002 2005 (17799) Information Security Audit Tool, described in [1-3], provides several hundred audit questions (the questions are stated in yes-no form) that indicate security practices that need to be implemented and actions that should be taken (in the case of a "no" answer to a question). Although these tools cannot be used independently without additional security measures, they are still useful for human auditors. Thus, the audit process can be viewed as one of asking questions and drawing conclusions from the answers.

Another effective tool for auditing is the development of a knowledge base that provides information for chief information security officers and helps them make the right management decisions about information security policy [4-5]. The main components of the knowledge base are: "asset", "source" (standard), "vulnerability", "step" (a refinement of the "guide" part in a special section of the standard), and others.

So far, the expert systems approach has been applied in the field of security in computer security testing. In [6], a security audit expert system is described that was developed for automating some audit procedures, like identifying potential security violations by examining system logs.

But thei application of expert systems methodology in testing information security in the broadest sense (not just computer security) (what we actually want to realise) remains largely untouched. Our task is to study and solve the problems of expert systems development in a broad area of information security auditing, which includes aspects of computer security.

Analysis of the objects and tools of information security in terms of building the model of structured objects.

A better understanding of the complex existing problems, the development of an effective security audit policy of the organisation and a policy of cooperation with service providers can be achieved by creating a multi-level structured model of the objects of information security. Its main essence is the following. The analysis of the information infrastructure allows us to select the seven levels of technology (see Figure 1) and the processes implemented in them, which are fundamentally different in terms of actual threats, threat factors, protection methods, performance criteria and terminology.

Level Number	Level Name
VII	Business Processes
VI	Applications
V	Database Management
IV	Operating Systems Management
III	Network Applications
II	Network Layer
I	Physical Layer

Fig. 1. Structured model of Information Security objects

The level of information security is the ability of an automated information system to withstand, for a given period of time, key information security threats such as possible breaches of confidentiality, integrity, and availability of information. [7-10]

To achieve an acceptable level of information security in an organization, we must meet the following criteria:

- minimize the current risks to information security;
- meet the necessary legal requirements for information security;

- conduct regular events to assess and mitigate the risks of security threats;
- be able to quickly restore the normal activities of the organization when an information security threat occurs [11-12].

The study of the architecture of automated information systems with taking into account the hardware-software tools determines the following a core group of objects exposed by the vulnerabilities and threats:

1) Technical devices as components of computer systems, such as motherboard, RAM, etc.

2) Computer network as communication of computer systems or computer equipment, such as modems, WiFi, etc which can be divided into "types of networks" and "protocols" groups;

3) Computer security applications as programs and additional devices to protect the computer from intrusion, intrusion, theft and damage of information. They can be divided into groups such as firewall, security programs, encryption and authentication systems;

4) Internet and web technologies as a combined worldwide system of computer networks and technologies that provide connectivity. They are divided into groups: IP, HTTP, Cloud, etc.

5) Common software areas as applications used by programmers, managers, architects, etc. They are divided into the following groups: Utilities, Operating Systems, Software for Information Systems Providers and Users, etc.

6) Mobile and tablet applications as applications for mobile devices and tablets, which are divided into the following groups: Utilities, Operating Systems, Software for Providers and Users of Information Systems, etc.

7) Database management systems as software for storing and managing data. They can be divided into two groups: a widely used type of data warehouse, relational databases, object-oriented databases, as well as cache or ConceptBase, operational data stores, data warehouses without the schema, etc.

After a thorough review of websites used to analyse the information security of computer systems, such as osvdb.org, cve.mitre.org, secunia.com, a list of objects frequently affected by security threats in the following areas was uncovered: Operating Systems, Programming Technologies, Encryption Technologies, Database Technologies, Computer Networks, and Domain Controllers [13-16].

All objects at risk from security threats can thus be summarized as follows (see Table 1):

Table 1

Summarizing of objects exposed by security threats

NN	**OBJECT**	**S/OBJECT1**	**S/OBJECT2**	**S/OBJECT3**	**S/OBJECT4**
	Technical means				
	Net	Types of Networks	Protocols		
	Computer Security Applications	Firewall	Safety Program	Encryption	Authentication Systems
	Internet and Web technologies	IP	HTTP	Cloud	
	Software public	Utilities	Operating Systems	Software Information Workers	
	Mobile and Tablet Apps	Utilities	Operating Systems	Software Information Workers	
	Database	Widely used for data warehouse	Object- oriented databases - cache or ConceptBase	Operational Data Warehouse	Data Warehouse without a schema

		type of relational databases			

For information security analysis, we can use the methodological basis of searching for threats and vulnerabilities presented in international standards such as IS Standards, Guidelines and Procedures for Auditing and Control Professionals; COBIT 4.1 "Control Objectives for Information and related Technology"; COBIT 4.1 "Control Objectives for Information and related Technology". Management Principles. Audit Manual; ISO 27001:2005 " Information Technology. Security Techniques in Information Security Management Systems"; ISO 20000 " Management of IT Services"; ISO 9000 " Quality Management Guidelines"; Board Briefing on IT Governance [17-18].

Generalized ontological model and building Expert System

By analyzing the existing threats to information and computer security, an expert system ontology has been developed that contains the main objects, assets, threats, vulnerabilities, and recommendations for security measures, which can be summarized in the following diagram (Figure 2) [8].

This information model and system allow solving a wide range of tasks in the field of information security, such as:

- the formation of a complex of measures to prevent leaks, which are particularly important for corporate information;
- the dynamic selection of security criteria depending on the size of the organization;
- a combination of fuzzy and crisp logic algorithms;
- automation of audit procedures;
- facilitation of the work or complete replacement of information security experts;
- the use of previously accumulated experience;
- development of the most effective recommendations;
- reduction of audit costs.

We would like to point out that we use the frame model for the knowledge representation in the information security audit expert system, while we use the forward chaining technique [8] for the decision system.

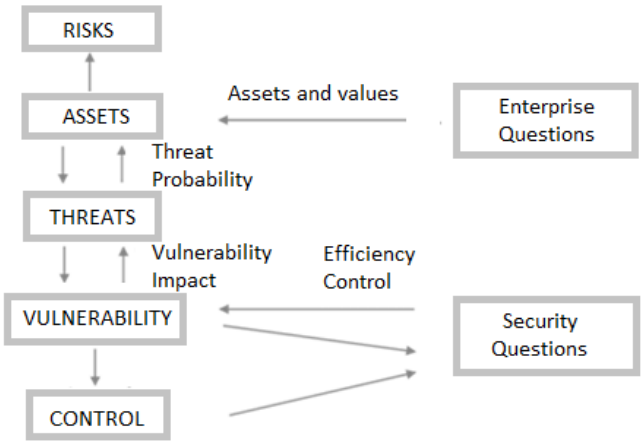

Fig. 2. Generalized ontological model

The user interface is intended for auditors or company employees who perform the information security audit. Through the interface, the auditor submits to the system the requested data, such as information about the information security requirements to protect the information. Through the interface, the initial selection of audited information security threats is provided. All information entered by the user through the interface is transferred to the working database.

The interface is used to transfer the expert knowledge of information security experts to the knowledge base as well as to adapt the knowledge already obtained. Experts can transfer their knowledge to the system through a knowledge engineer or independently. The interface provides for the modification of decisions. This is done only when the expert system needs to be supplemented or corrected [11-13].

The external interface is used to provide the weighting coefficients of met and unmet information security requirements to the certain entity for calculating the degree of protection and to build the system of recommendations for improving the degree of information security [14].

Structurally, the expert system can be composed of the following components (Figure 3):

- solver (interpreter);
- working memory, also known as a database;
- knowledge base;
- components of knowledge acquisition;
- explanatory component; and
- dialog component.

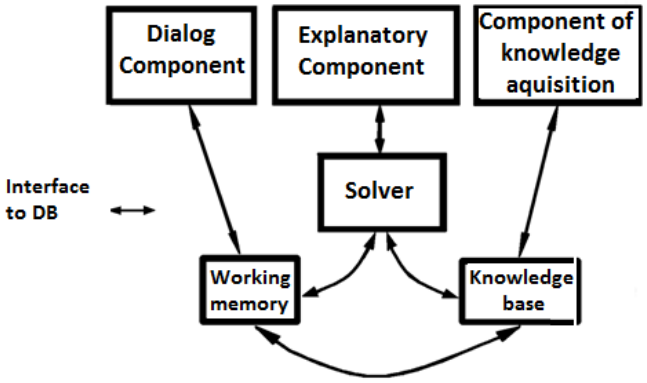

Fig. 3. Expert System Structure

The database (or working memory) is used to store initial and intermediate data for the problem currently being solved. This term coincides more with the name but not with the sense of the term used in information retrieval systems and database management systems to refer to all data stored in the system over the long term.

The knowledge base in the proposed expert system is used for long-term storage of data describing the domain under consideration (rather than current data) and rules describing appropriate data transformation in that domain.

The solver uses raw data from main memory and knowledge data from the knowledge base to generate a sequence of rules that, when applied to the raw data, lead to the solution of the problem.

The knowledge acquisition component automates the process of filling the expert system with knowledge by the user-expert.

The explanation component explains how the system creates the solution and what kind of knowledge it uses. Thus, it facilitates testing by experts and increases the user's confidence in the result.

The dialog component focuses on organizing friendly communication with the user during the decision-making process and when acquiring knowledge and explaining the results.

An expert system works in two modes: knowledge acquisition and problem solving mode (or the so-called consulting mode or mode of using an expert system).

In the knowledge acquisition mode, communication with the expert of the expert system is done with the help of the knowledge engineer. In this mode, the expert fills the knowledge acquisition component with knowledge that enables the expert system to make decisions independently (without the expert) to solve the problems in the topic area. The expert describes the problem domain as a set of data and rules. Data define the objects, their properties and values that exist in the subject area. Rules define the ways to manipulate the data that are specific to that subject area.

We can state that the way of knowledge acquisition in the traditional approach to software development corresponds to the phases of algorithm creation, programming and debugging by the developer. Thus, in contrast to the traditional approach, in the case of the expert system, system development is performed by an expert who is not a programmer.

In the consulting mode, communication with the expert system is done by the end user, who is interested in the result and (or) the method of obtaining it. In this mode, the user data for solving the

problem enters the working memory after being processed by the dialog component. The solver creates the solution to the problem based on the input from the working memory, general information about the subject area, and the rules of the knowledge base. To solve the problem, the expert system not only adopts the given sequence of operations, but also creates them.

Thus, the proposed expert system uses the user interface to create a summary report with the results of the test and make recommendations. One of the parts of the recommendations is related to active audit results based on a combination of recommendations on basic standards and certain applicable security tools[14, 15].

The process of creating recommendations based on active information security audit results.

Active testing of the information security system is a collection of information about the state of the firewall using special software and special techniques. By the state of the firewall is meant only those options and settings, the use of which helps the attacker to penetrate the network and cause damage to the company. Within this type of audit, it is possible to model as many possible network attacks that an attacker can perform.

The result of the active audit process is obtaining information about all vulnerabilities, their criticality and their remediation methods, widely available information that any potential attacker of the customer's network could have access to.

Upon completion of this type of audit, we can obtain recommendations for network security modernization that will help eliminate dangerous vulnerabilities and thereby improve the security of the information system from the attacker's actions with the least amount of effort.

Thus, the active audit should be performed at regular intervals to ensure that the level of security has not decreased.

Let us consider the procedures for determining the software to identify and fix threats and vulnerabilities to form the recommendations in the expert system. This is the first step in forming recommendations during the active audit process. Typically, the threat and vulnerability identification process assumes that the attacker is using free proprietary software or some other method to identify and exploit network node vulnerabilities and does not have sufficient independent information system research and troubleshooting skills to identify unpublished vulnerabilities and threats and develop specialized software for these operations. Key software and hardware used in this case include the following

Tools BackTrack 5R1; Nmap; MaxPatrol; Nessus; NeXpose; Metasploit (framework & community); Acunetix WVS; osvdb.org; cve.miter.org; secunia.com; securityfocus.com; kb.cert.org.

The above-mentioned products enable the creation of a comprehensive and integrated solution for the protection of the company's IT infrastructure, which includes more than 30 objects and procedures related to ISO2700x standards

The second part of the process of creating recommendations consists in defining test methods for protecting information and ensuring a sufficient level of information security [16].

In accordance with the PCI DSS information security standards, both external and internal so-called penetration testing should be performed in every organization. This testing method is performed in the organizations to identify existing threats and vulnerabilities [17]. In particular, such penetration tests have been conducted in educational institutions to find the gaps in information security.

The main procedures that should be used in penetration testing to find vulnerabilities and threats in the information security system can be presented as follows:

- External penetration testing, where an attacker or other subject who's access to the resources of the Internet has access to a list of only some data and doesn't have the detailed data of the organization's network infrastructure;

- Internal penetration testing, in which an attacker or other subject who has the ability to connect to the guest segment of the internal network and has local administrative privileges on the network connects to the workstation. Thus, the attacker can be an employee of a third party, e.g. a consultant, who has the ability to connect to a mobile workstation on the network that is not controlled by an administrator, but has no logical rights in the information system.

Internal penetration testing of the school networks enabled verification of all physical and logical elements that ensure the protection of confidential information:

1) Preparation of information for scan (IP addresses that have been scanned; URL, that have been scanned)

2) IP-address range;

3) Detection stage as a definition of active nodes, open ports, borders comparison test with the information obtained;

4) Testing by using special programs;

5) Testing manually and tests for specific situations in the educational process;

6) Conduct DOS- attack in specifically agreed time.

Using these models to identify threats and vulnerabilities assumes that the attacker is using free or commercial software or some other method to identify and exploit network node vulnerabilities and does not have sufficient capabilities to independently research and troubleshoot information systems to identify unpublished vulnerabilities, threats, and develop specialized software for these operations. Key software and hardware components in this case include the aforementioned software.

While working on the analysis and testing of the main information security methods and tools to achieve the goals of testing the level of information security, we performed the following tasks:

- Collection of data on the targeted network nodes, the definition of open ports, device types and versions, operating system, network services and applications on the reaction to external actions;
- Identifying vulnerabilities in operating systems, network services and applications of targeted network nodes;
- Analysis of the interaction between the components of the system;
- Disassembling and analyzing the client application that is used to implement user access to the system «SSS»;
- Automated analysis of network equipment configuration files;
- External penetration testing.

In identifying network node vulnerabilities, we worked on remote target systems to identify vulnerabilities related to both the faulty implementation of the operating system, network services, and applications, and the faulty configuration of the target systems, which allow unauthorized access to information resources on the internal network or backend server systems such as "SSS," as well as attempts to directly access the internal network hosts.

The main purpose of the analysis was to find the login/password pairs stored directly in the application with access to the server-side system.

During the conducting external testing were used the following vulnerabilities:

- Cross-Site Request Forgery as a kind of attack on the web sites visitors by using the HTTP protocol shortcomings, but this vulnerability has not been detected during testing.
- Path Traversal as machinery attacks aimed at gaining access to files, directories, and commands located outside the main directory of the Web server. An attacker could manipulate the URL parameters in order to obtain access to the files or execute commands located in the file system Web server, but this vulnerability also has not been detected during testing.

-Denial of Service (DoS) as a class of attacks aimed at violation availability Web server. Usually these attacks against denial of service are implemented at the network level, but they can be operated on the application level as well. By using the Web-based applications, the attacker can deplete critical system resources, or to exploit this vulnerability, leading to the cessation of operation of the system, but this vulnerability also has not been detected during testing.

There were identified the following weaknesses in information security:

- Arp-poisoning attack: During the work the data link layer attack by type of arp-poisoning was done. This type of attack is for presenting the computer intruder as the main router to the targeted host, which leads to intercept all network traffic of the host attacked. The attack was directed at the sample workstations, randomly selected from a range of network addresses 172.26.181.0-24.

Captured NTLMv2 hashes during the attack arp-poisoning were undergone by cryptanalysis based on brute force dictionary. Bust was made within 2 days by using the dictionaries set containing

a total of more than 3 million words of Russian and English languages, common passwords, as well as various combinations of words with numbers and punctuation marks (hybrid dictionary with substituting the word up to 2 characters).

- Getting information from the DNS: For information about the names and addresses of targeted systems the DNS- zones transfer were attempted. It should be noted that a successful transfer zones is not directly the result of penetration, but definitely it helps to attacker in the research process, providing a complete map of the network infrastructure.

- Checking the not updated software: By checking the not updated systems we discovered vulnerabilities (see table 2) associated with this problem: not updated the system software of the operating system.

Exploitation of some vulnerabilities can lead to the disruption of business processes or the assumption of control over information systems, and thus their use in future studies, as a data source, or as interim support.

Based on the results of the vulnerability and threat reports received, we can define recommendations for addressing deficiencies in the development of information infrastructure, maintenance and management of information systems, and completeness of legal documents. In particular, the detected breaches and threats due to non-compliance with information security standards and requirements can increase the risk of unauthorized transactions, disclosure of confidential information and incorrect recovery of the information system in emergency situations. Thus, the expert system reveals the gaps and their importance in providing remediation.

Conclusion

The closer the system is to human expert behavior, the more effectively it can perform the task for which it was created. An expert system used in the field of information security is a sufficient technique for imitating the decision-making ability of specialists and a tool for reducing the cost of the audit process.

There are still many unsolved problems in the development of expert systems in the field of information security auditing, but the use of fuzzy logic techniques, specially developed methods for decision-making systems and the generation of recommendations, the formation of rules, and the obtaining of basic structures for the development of knowledge bases [8,14,15,18-19] make research in this area worthwhile and promising
We can conclude that these research directions can become a good scientific basis for the development of artificial intelligence.

Further research in this area concerns the establishment of a solid foundation for the decision support system through the formation of an expert knowledge base supported by an updated knowledge database system, a flexible fuzzy rule base, and the updating and review of the recommendation component in light of the application of new software and hardware tools.

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INVESTIGATION OF NONLINEAR RESISTIVE CIRCUITS FOR TIME RELAY CONTROL IN THE FIELD OF ELECTRICAL ENGINEERING

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УДК 621.311.721

ИССЛЕДОВАНИЕ НЕЛИНЕЙНЫХ РЕЗИСТИВНЫХ ЦЕПЕЙ ДЛЯ УПРАВЛЕНИЯ РЕЛЕ ВРЕМЕНИ В ОБЛАСТИ ЭЛЕКТРОТЕХНИКИ

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Abstract

The article considers transient processes with the solution of differential equations of state by the numerical method of the proposed non-contact high-speed time relay.

Аннотация

В статье рассмотрены переходные процессы с решением дифференциальных уравнений состояния численным методом предложенной бесконтактной быстродействующей реле времени.

Keywords: optocoupler, photodiode, diode, resistance, capacitor, thyristor, time relay.

Ключевые слова: оптопара, фотодиод, диод, сопротивление, конденсатор, тиристор, реле времени.

Введение. В настоящее время в связи с широкой автоматизацией производственных процессов, внедрением систем автоматического управления, существенно выросли требования к надежности, быстродействию и долговечности электрических приборов и аппаратов. Этим требованиям значительной степени отвечают устройства, основанные на использовании свойств и явлений, присущим нелинейным резистивным цепям. В дальнейшем ожидается существенное расширениие области применений нелинейных цепей в качестве приборов и аппаратов с новыми качественными свойствами. В настоящее время в качестве силовых ключей коммутирующих, регулирующих и преобразующих устройств, как правило, используются полупроводниковые цепи. На основе теоретических анализов и экспериментальных исследовании нелинейных резистивных цепей установлено, что для обеспечения качественного электроснабжения потребителей, необходимо использовать такие цепи в качестве силовых бесконтактных коммутирующих устройств. Схемы на базе нелинейных резистивных цепей позволяют осуществить коммутацию силовых нагрузок при

лучших динамических режимах, а именно, при прохождении синусоидального тока через ноль, что обеспечивает улучшение режима переходного процесса [1-4].

Иногда при схемных решений, таких как, релейная защита и автоматика, параллельная работа тиристоров и т.п. необходимо задержка импульсов управления по времени. Поэтому создание малогабаритных, быстродействующих, бесконтактных реле времени является актуальным.

Результаты и обсуждение. В данной статье рассматриваются вопросы создания таких реле на базе резистивных цепей. При создании и разработке новых технологии возникают вопросы расчета и анализа таких цепей. При этом находят широкое применение неавтономные нелинейные динамические цепи с диодом, активным сопротивлением и емкостью. При разработке систем управления для устройств автоматики можно использовать различные схемные решения [2, 5-7].

Проведем теоретический анализ схемы, приведенной на рис.1, где последовательно соединяются активное сопротивление (R_1), диод (*VD*) и емкость (*C*), параллельно к емкости соединятся активное сопротивление (R_2) и фотодиод оптрона (*VU*).

Рассмотрим переходные процессы в периоды открытого состояния диода *VD*, напряжение на емкости описывается следующим уравнением:

$$U_C = U_m \cdot \frac{R_2}{R_1 + R_2}\left(1 - e^{-\frac{R_1+R_2}{R_1 \cdot R_2 \cdot C}t}\right), \qquad (1)$$

здесь, U_m - номинальное напряжение сети.

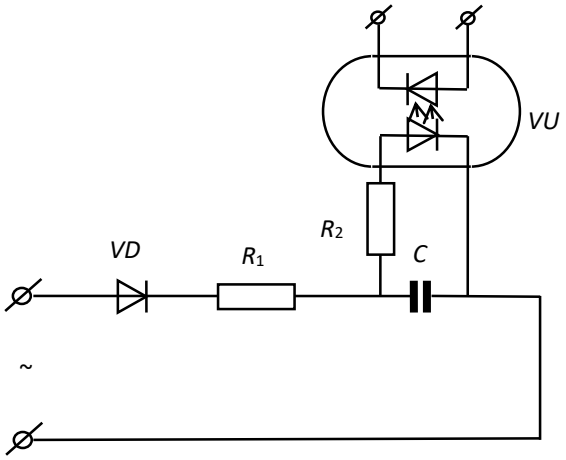

Рис.1. Принципиальная схема нелинейного резистивного цепи

В настоящее время широко применяются различные методы анализа таких цепей. Нами предлагается использовать численное решение уравнений состояния цепи методом Эйлера. При этом на некотором отрезке необходимо определить приближенное решение уравнения:

$$\frac{dy}{dt} = f(t, y) \qquad (2)$$

Принимаем характеристику диода идеальной и допускаем, что $u=U_m Sin\omega t$. Тогда с момента $t=0$ до t_1 диод открыт, и уравнение цепи имеет следующий вид:

$$U_m \sin \omega t = R_1\left(C\frac{dU_C}{dt} + \frac{U_C}{R_2}\right) + U_C$$

или

$$\frac{dU_C}{dt} = \frac{1}{R_1 C}\left[U_m \sin \omega t - U_C\left(1 + \frac{R_1}{R_2}\right)\right] \qquad (3)$$

где, U_C – напряжение на ёмкости.

Решение уравнения (3) по Эйлеру выглядит следующий вид:

$$U_{C(k+1)} = U_{Ck} + f(U_{Ck}, t_k) \cdot h \tag{4}$$

Здесь,

$$f(U_{Ck}, t_k) = \frac{1}{R_1 C}\left[U_m \sin \omega t - U_C\left(1 + \frac{R_1}{R_2}\right)\right] \tag{5}$$

k=0, 1, 2, …, n. ; h – шаг интегрирования.

С момента $t=0$ до $t=t_1$ напряжение на ёмкости определяется по (4) с нулевым начальным условием. С момента $t=t_1$ диод переходит в закрытое состояние и напряжение на ёмкости определятся как:

$$C\frac{dU_C}{dt} = -\frac{U_C}{R_2} \quad \text{или} \quad \frac{dU_C}{dt} = -\frac{U_C}{CR_2} \tag{6}$$

С момента $t=t_3$ диод снова переходит в открытое состояние и напряжение на ёмкости снова описывается зависимостью (4), только с начальными условиями соответствующие времени $t=t_2$.

На рис.2 показаны кривые зависимости напряжения на ёмкости от времени при различных параметрах элементов цепи.

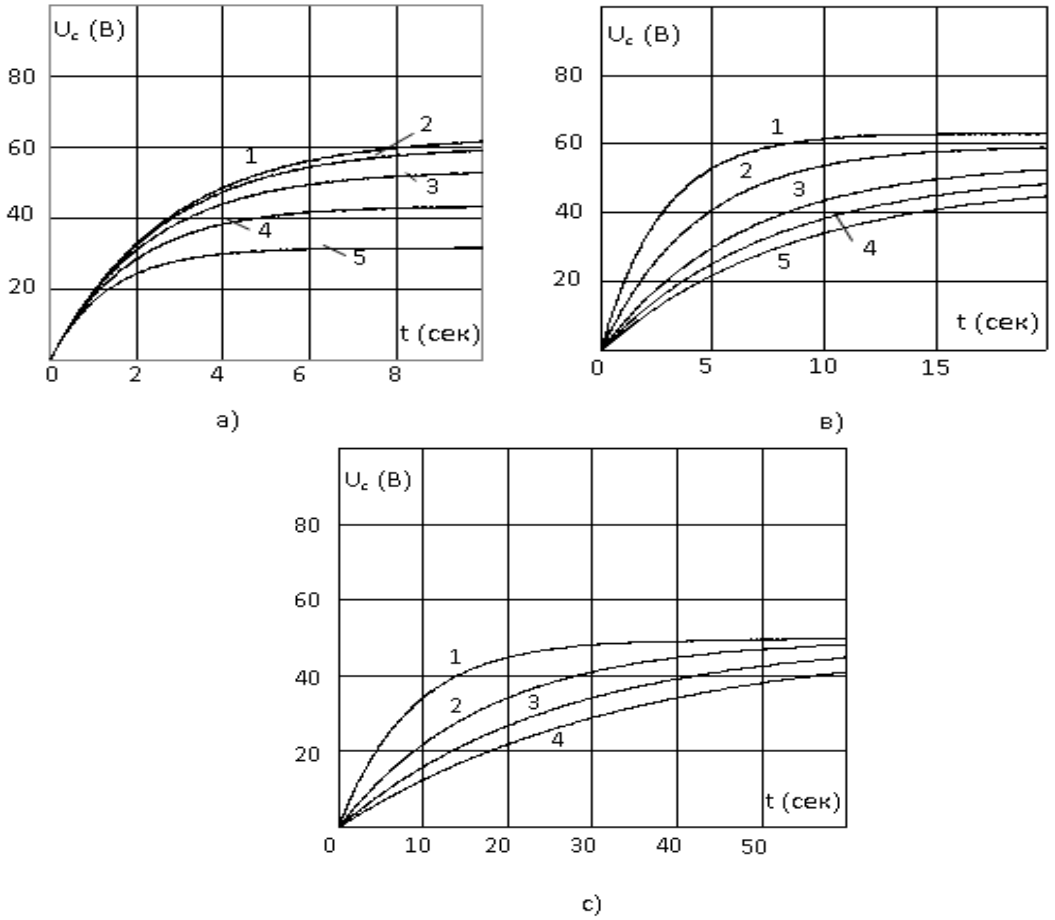

Рис.2. Характеристики зависимости $U_c=f(t)$

На рис.2.а, показаны характеристики зависимости $U_c=f(t)$. Эти характеристики построены для различных значений сопротивлений R_1. При этом R_2 и C остаются постоянными. Кривая 1 при R_2=3000 Ом; 2 - R_2=2000 Ом; 3 - R_2=1000 Ом; 4 - R_2=500 Ом; 5 - R_2=250 Ом; C=10 мкФ и R_1=300 Ом.

На рис.2.в, показаны характеристики зависимости $U_c=f(t)$. Эти характеристики построены для различных значений сопротивлений R_2. При этом R_1 и C остаются постоянными. Кривая 1 при R_1=300 Ом; 2 – R_1=500 Ом; 3 – R_1=800 Ом; 4 – R_1=1000 Ом; 5 – R_1=1200 Ом; C=10 мкФ и R_2=3000 Ом.

На рис.2.с, приведены характеристики зависимости $U_c=f(t)$. Эти характеристики построены для различных значений сопротивлений R_1. При этом C и R_2 остаются постоянными. Кривая 1 при C=10 мкФ; 2 – C=20 мкФ; 3 – C=30 мкФ; 4 – C=40 мкФ; R_1=1200 Ом и R_2=3000 Ом.

Из этих зависимостей видно что, изменяя параметры цепи можно регулировать время полной зарядки конденсатора.

Предложенная бесконтактная реле были исследованы в лаборатории Электроэнергетического факультета Ташкентского Государственного технического университета [3-4, 8-10].

Из рис.2 видно, что изменение параметра R_2 почти не влияет на время зарядки конденсатора C, а изменение параметров R_1 и C существенно изменяет время зарядки конденсатора, следовательно и время работы оптопары.

На основе выше изложенного можно сделать следующие **заключения:**

Используя схему, представленную на рис.1 можно создать бесконтактное, быстродействующее и реле времени, изменения параметров активного сопротивления R_1 или емкости C.

Предложенная методика позволяет производить качественный анализ установившихся режимов и переходных процессов цепей при различных вариациях параметров.

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USE OF GAS PRESSURE DROP AT A GAS DISTRIBUTION POINT AS A SOURCE OF SECONDARY ENERGY RESOURCES

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ИСПОЛЬЗОВАНИЕ ПЕРЕПАДА ДАВЛЕНИЯ ГАЗА НА ГАЗОРАСПРЕДЕЛИТЕЛЬНОМ ПУНКТЕ В КАЧЕСТВЕ ИСТОЧНИКА ВТОРИЧНЫХ ЭНЕРГОРЕСУРСОВ

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Abstract

The article considers the possibility of generating electricity without burning fuel by expanding high-pressure natural gas at gas distribution stations with lower specific capital costs.

Аннотация

В статье рассматриваются возможности производства электроэнергии без сжигания топлива детандированием природного газа высокого давления на газораспределительных станциях с меньшими удельными капитальными затратами.

Keywords: fuel natural gas, gas reduction, expander-generator unit, air heat exchanger, gas heating, heat pump, power generation, energy efficiency.

Ключевые слова: топливный природный газ, редуцирование газа, детандер-генераторный агрегат, воздушный теплообменник, подогрев газа, тепловой насос, выработка электрической энергии, энергоэффективность.

В мировой энергетике подавляющее количество электроэнергии и теплоты производят на установках, использующих для работы энергию, выделяющуюся при сжигании органического топлива. За последние годы в большинстве промышленно развитых стран созданы и внедрены достаточно совершенные установки для преобразования энергии органического топлива в электрическую энергию и теплоту. Дальнейшее повышение технико-экономических показателей таких установок требует поиска новых, нетрадиционных методов, применение которых позволило бы существенно повысить технико-экономические показатели работы энергетического оборудования и одновременно улучшить его экологические показатели.

Одной из возможностей решения этой проблемы на промышленных предприятиях, использующих в качестве топлива природный газ, является применение детандер-генераторных агрегатов (ДГА), принцип действия которых основан на использовании технологического перепада давления транспортируемого природного газа.

Мировая энергетика уже около 40 лет использует технологические перепады давления транспортируемого природного газа. Начиная с 70-х годов прошлого столетия, на ряде

газораспределительных станций и газорегуляторных пунктов промышленных предприятий Западной Европы, США, а также других стран, стали успешно использоваться установки, цель которых — использование избыточного давления транспортируемого природного газа для получения электрической энергии. Эти установки получили название детандер-генераторные агрегаты. На сегодняшний день известны более 200 установок, использующих детандер-генераторную технологию для производства, в основном, электроэнергии. Необходимо отметить, что практически все существующие установки для обеспечения своей работы требуют сжигания топлива, что, даже при исключительно высокой их энергетической эффективности, тем не менее, приводит к загрязнению окружающей среды.

Появившиеся в последнее время технические решения в области детандер- генераторной технологии позволили разработать схемы бестопливных детандер- генераторных установок. В установках такого типа для обеспечения работы используется низкопотенциальное тепло окружающей среды или вторичных энергетических ресурсов.

Усложняется экологическая, ситуации, связанная с увеличением выбросов токсичных и канцерогенных продуктов сгорания, а также веществ, разрушающих озоновый слой атмосферы. Существующие методы очистки не могут полностью избавить от негативных последствий выбросов. Значительный вред окружающей среде наносится не только при сжигании топлива, но и при его добыче, обработке, транспортировке, захоронении его отходов.

Термодинамический анализ работы детандер-генераторных агрегатов, [1-3], позволил выявить преимущества получения электроэнергии с применением детандер-генераторной технологии перед производством электроэнергии наиболее распространенным на сегодня способом - на тепловых электрических станциях и сделать следующие основные выводы.

1. В детандере детандер-генераторного агрегата происходит преобразование подведенной к газовому потоку теплоты в механическую работу. Это требует обязательного подвода теплоты к газу (подогрева газа) в детандер-генераторном агрегате.

2. Детандер-генераторные агрегаты представляют собой устройства, для обеспечения работы которых могут быть порознь или одновременно использованы как энергия, выделяющаяся при сжигании топлива, так и вторичные энергетические ресурсы низкого потенциала или возобновляемые источники энергии.

Использование детандер-генератора турбинного типа для редуцирования и попутной утилизации энергии потока газа для электроснабжения систем телеметрии, телемеханики, освещения и электрохимзащиты позволит отказаться от необходимости использования традиционных дросселирующих устройств и подключения к линиям электропередач (ЛЭП) или периодической перезарядки аккумуляторов обслуживающим персоналом.

Для изучения процессов, связанных с работой ДГА и теплонасосной установки (ТНУ) на станциях технологического понижения давления газа в системах газоснабжения, на предприятиях, использующих в качестве топлива природный газ, была создана экспериментальная установка, схема которой представлена на рис.1.

Основной частью экспериментальной установки были воздушный тепловой насос (теплоноситель -воздух), высокоточный ультразвуковой расходомер для измерения расхода газа (инструментальная погрешность ультразвукового расходомера 5%), два измерительных комплекса с Ni-CrNi термопарами.

Проводилось также измерение потребляемой приводом компрессора электрической энергии (инструментальная погрешность прибора измерения электроэнергии - 5%).

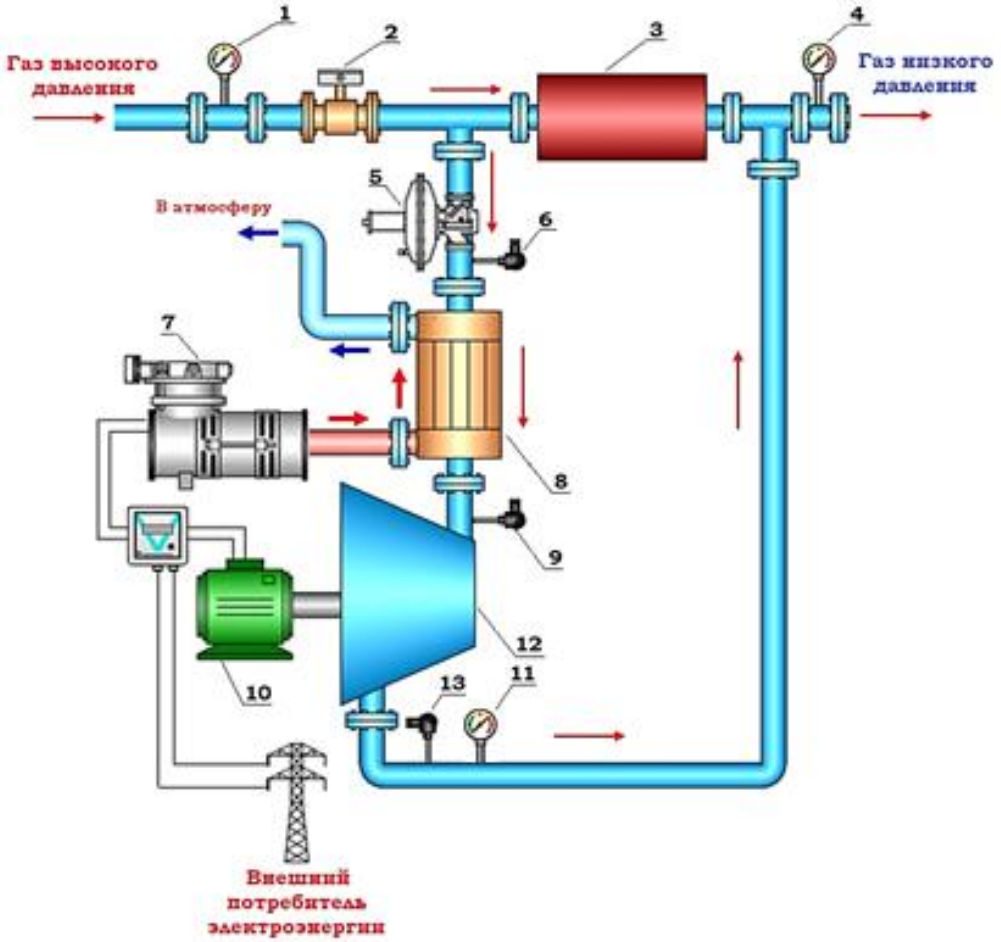


Рис.1. Схема экспериментальной установки с детандер-генераторным агрегатом и воздушным тепловым насосом для подогрева газа перед детандером

1,4,11 – манометры; 2 – расходомер газа; 3 – дросселирующее устройство; 5 – регулятор давления газа; 6,9,13 – датчики температуры газа; 7 –компрессор; 8 –теплообменник подогрева газа перед детандером; 10 – электрогенератор; 12 – турбодетандер

Установка содержит кинематически соединенный с электрическим генератором 10 детандер 12. Детандер подключается параллельно дросселирующему устройству 3, разделяющему трубопроводы высокого и низкого давления. Теплообменник 8, служащий для подогрева газа высокого давления, является одновременно и конденсатором теплонасосной установки, в состав которой входят также компрессор 7, приводимый в действие электродвигателем. Электрические связи предназначены для подачи электроэнергии на электродвигатель теплонасосной установки и внешнему потребителю соответственно.

Установка работает следующим образом. Газ высокого давления поступает в теплообменник 8, греющей средой в котором является нагретый воздух компрессора. Нагретый в теплообменнике газ высокого давления подается в детандер 12. После расширения в детандере, газ направляется в трубопровод низкого давления, а механическая работа, полученная в детандере, преобразуется в электрическую энергию в электрогенераторе 10. Часть электроэнергии, выработанной генератором, должна быть израсходована на технологический подогрев газа перед детандером посредством воздушной ТНУ. Оставшаяся электроэнергия может быть полезно использована для отпуска внешнему потребителю или производства дополнительной теплоты с помощью той же теплонасосной установки. Эта теплота может быть использована для дополнительного подогрева газа в теплообменнике.

Из приведенного описания ясно, что для обеспечения работы теплового насоса в рассматриваемых установках используется электроэнергия, выработанная генератором ДГА, что уменьшает полезную электрическую мощность установок, т.е. мощность, которая может

быть передана потребителю, по сравнению с ДГА, в которых для подогрева газа используется теплота высокого температурного потенциала, полученная при сжигании топлива.

При определении эффективности работы энергогенерирующих установок в качестве первоочередной задачи рассматривается выбор критериев оценки эффективности работы установок. От правильного выбора критериев оценки в значительной степени зависит представительность полученного при анализе результата.

Особого внимания требует вопрос выбора критериев при оценке эффективности работы установок, в состав которых входят детандер-генераторные агрегаты. Это объясняется тем, что, ДГА не является тепловой машиной и традиционно применяемые для оценки эффективности работы установок, представляющих собой тепловые машины, коэффициенты полезного действия, в состав которых входит термический КПД, здесь использованы быть не могут. Необходимо, также, учитывать, что установка является бестопливной, и в этом случае для решения поставленной задачи в качестве критериев оценки эффективности работы могут быть рассмотрены такие, как электрическая мощность, вырабатываемая ДГА, электрическая мощность, отдаваемая установкой в сеть, доля выработанной ДГА электрической мощности, отдаваемая в сеть, эксергетический КПД установки, эффективность использования теплоты, подведенной к установке, технико-экономические показатели работы установки.

В рассмотренной выше схеме установки предусмотрен подогрев магистрального газа перед впуском в ДГА. Если для этого используется теплота, получаемая от внешних источников (возобновляемые источники теплоты, промышленные сбросные воды и т.п.), то вся вырабатываемая ДГА электрическая мощность может быть направлена в местную или внешнюю электросеть. При отсутствии таких источников подогрев осуществляется за счет теплоты, получаемой от тепловых насосов, на привод которых приходится затрачивать некоторую часть электрической мощности, вырабатываемой ДГА. Эта электрическая мощность существенно зависит от выбранного цикла теплового насоса, термодинамических свойств, применяемого в нем рабочего вещества, а при выбранных этих факторах - от температуры, получаемой от теплового насоса теплоты. Соотношением выработанной в ДГА и затраченной в ТНУ работ и определяется оптимальная температура подогрева газа, при которой в сеть выдается максимальная доля полученной в ДГА электрической мощности.

Доля выработанной ДГА электрической мощности, отдаваемая в сеть, определяется выражением

$$\varphi = \frac{N_{\text{сеть}}}{N_{\text{ДГА}}}, \tag{1}$$

где $N_{\text{ДГА}}$ - электрическая мощность, вырабатываемая ДГА;

$N_{\text{сеть}}$ - электрическая мощность, отдаваемая установкой в сеть.

Так как, детандер-генераторный агрегат не является тепловой машиной, то к нему не применимы большинство понятий КПД, используемых обычно для характеристики энергетических установок. Для оценки его с точки зрения совершенства протекающих в нем процессов преобразования энергии может быть использован эксергетический КПД - понятие, применимое к любым процессам и устройствам.

Эксергетический КПД рассматривается обычно в виде [66]

$$\eta_{\text{э}} = \frac{\sum E_{\text{вых}}}{\sum E_{\text{вх}}}, \tag{2}$$

где $\sum E_{\text{вх}}$ и $\sum E_{\text{вых}}$ - суммы эксергий потоков на входе в установку и на выходе из нее соответственно.

Существует также и другое выражение для эксергетического КПД [4]

$$\eta_э = \frac{L}{\sum E_{вх} - \sum E_{вых}}, \quad (3)$$

в котором L - полученный в системе полезный эффект, при этом полагается, что в сумму эксергий выхода $\sum E_{вых}$ полезный эффект L не входит.

С учетом уравнения эксергетического баланса системы

$$\sum E_{вх} - \sum E_{вых} = Д\ , \quad (4)$$

где $Д$- суммарные внутренние и внешние потери эксергии в системе, выражение (2) для эксергетического КПД может быть записано в виде

$$\eta_э = 1 - \frac{Д}{\sum E_{вх}}, \quad (5)$$

При таком методологическом подходе внутренние потери эксергии представляют собой потери, связанные с необратимостью процессов, к внешним же потерям относят потери эксергии, вызванные взаимодействием системы с окружающей средой.

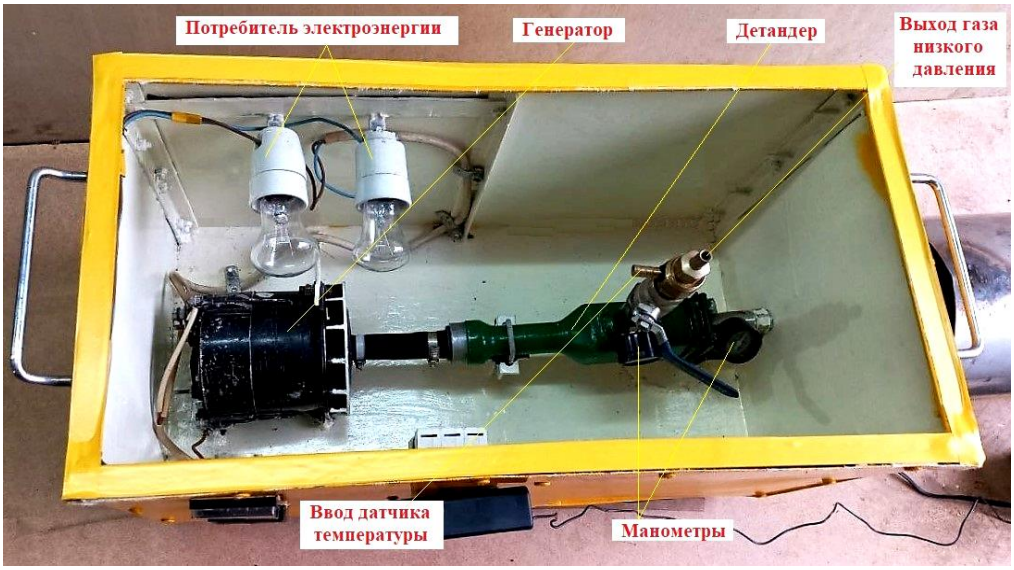
Рассмотренные зависимости относятся к эксергии, полученной газом при подогреве. Но подогрев газа может осуществляться за счет теплоты, отбираемой от различных источников, и, соответственно, сопровождаться различными потерями эксергии. В зависимости от типа источника затраты эксергии на подогрев газа будут различными и, следовательно, будут различными эксергетические КПД детандер-генераторной установки.

Предварительный анализ целесообразности применения того или иного из рассмотренных выше критериев показывает, что наибольшее практическое значение имеют: доля выработанной ДГА электрической мощности и эксергетический КПД установки. Однако при решении частных задач, могут найти применение и другие критерии.

Следует подчеркнуть, что практически все известные проекты использования избыточной энергии давления газа при его редуцировании в системах газораспределения и потребления направлены на производство электрической энергии. Однако при адиабатном расширении газа с отдачей внешней работы существенно снижается температура рабочего тела, величина этого снижения определяется отношением давлений на входе и выходе расширительной машины (детандера).

Расчеты показывают [5], что при понижении давления газа с 1,2 до 0,3 МПа температура его снижается на 50–60 °С (в зависимости от состава газа и эффективности детандера). При увеличении степени понижения давления до 6 (от 1,8 до 0,3 МПа) разность температур возрастает до 70–80 °С. Если принять, что температура газа на входе в машину равна 20 °С, температура потока после расширения составит -30 – -40 °С в первом и -50 – -60 °С во втором случаях.

При проведении исследования требовалось выводить установку (рис.2) в стационарный режим работы, когда изменение измеряемых величин не происходит, либо происходит незначительное их изменение. Отклонение измеряемой величины в этом случае не должно приводить к завышению погрешности всего эксперимента. Если отклонение измеряемых величин от их средних величин составляло менее 5 % (для данной серии экспериментов), то полагалось, что такой процесс можно считать стационарным. Кроме того, при выходе на стационарный режим не должно было происходить отключения компрессора.



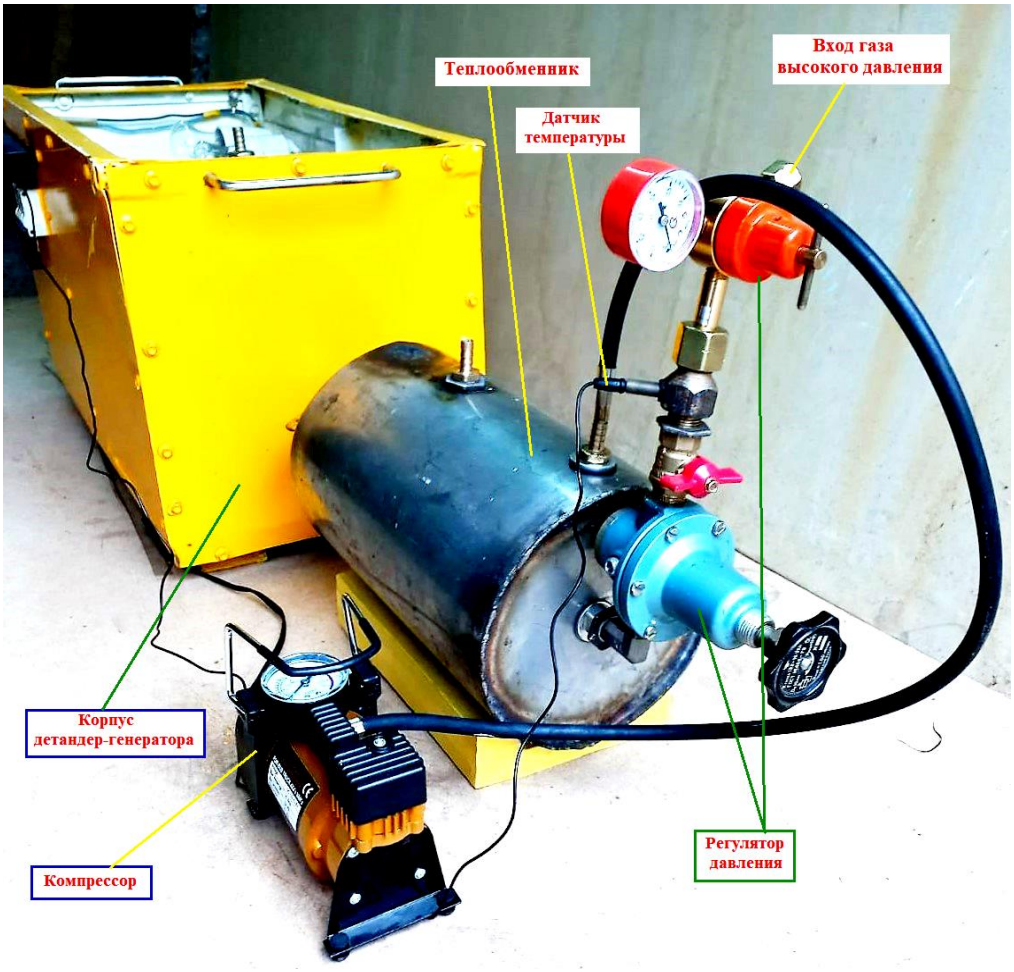


Рис.2. Фрагменты детандер-генераторного агрегата

Исходные данные для расчёта:

$\rho_{см} = 0{,}709$ кг/м^3; $t = 40\ ^0$C; $P_{вх} = 0{,}6$ МПа; $P_{вых} = 0{,}15$ МПа;

$Q = 810000$ м^3/мес.

Индивидуальная газовая постоянная R, кДж/кг·К, для газовой смеси природного газа:

$$R = \frac{R_0}{M_{см}} = \frac{8{,}314}{15{,}97} = 0{,}523 \text{ кДж/кг} \cdot \text{К},$$

где $M_{см}$ – молекулярная масса газовой смеси, кг/кмоль; R_0 – универсальная газовая постоянная, Дж/(моль·К); $R_0 = 8,314$ Дж/(моль·К) .

Молекулярная масса газовой смеси, $M_{см}$, кг/кмоль:

$$M_{см} = \rho_{см} \cdot 22,4 = 0,709 \cdot 22,4 = 15,97 \text{ кг/кмоль}$$

где V_i – объёмные концентрации компонентов газа, %: V_1 – (90-97,9%) объёмная концентрация метана; V_2– (0,75-4,75%) объёмная концентрация этана; V_3– (0,30-1,2%) объёмная концентрация пропана; V_4– (0,01-0,5%) объёмная концентрация i-бутана; V_5– (0-0,4%) объёмная концентрация n-бутана; V_6– (0-0,2%) объёмная концентрация i-пентана; V_7– (0-0,15%) объёмная концентрация n-пентана; V_8– (0-0,3%) объёмная концентрация гексана; V_9– (0,1-2,5%) объёмная концентрация углекислого газа; V_{10}– (0,2-1,3%) объёмная концентрация азота; V_{11}– (0-0,3%) объёмная концентрация кислорода.

***m_i*– молярная масса компонентов, кг/моль:** m_1 =16,04 - молярная масса метана; m_2 =30,07 - молярная масса этана; m_3 =44,09 - молярная масса пропана; m_4 =58,12 - молярная масса i-бутана; m_5 =58,12 - молярная масса n-бутана; m_6 =72,15 - молярная масса i-пентана; m_7 =72,15 - молярная масса n-пентана; m_8 =86,18 - молярная масса гексана; m_9 =44,01 - молярная масса углекислого газа; m_{10} =28,01 - молярная масса азота; m_{11} =31,99 - молярная масса кислорода.

Перепад энтальпии при адиабатическом процессе расширения газа, $H_{АД}$, кДж/кг, в детандер–генераторе:

$$H_{АД} = \frac{k}{k-1} \cdot z \cdot R \cdot T \cdot \left(1 - \left(\frac{P_{вых}}{P_{вх}}\right)^{\frac{k-1}{k}}\right) = \frac{1,3}{1,3-1} \cdot 0,9933 \cdot 0,523 \cdot 313 \cdot \left(1 - \left(\frac{0,15}{0,6}\right)^{\frac{1,3-1}{1,3}}\right) = 193,1 \text{ кДж/кг}$$

где z – коэффициент сжимаемости, в зависимости от температуры и давления; z = 0,9933; k – объёмный показатель адиабаты, в зависимости от температуры и давления (если дана плотность смеси $\rho_{см}$, то k = 1,3); k =1,3; R – индивидуальная газовая постоянная, Дж/кг·К; Т – температура газа на входе в ДГА, ^{0}К; где Т = t + 273; t – ^{0}С; $P_{вх}$– давление газа на входе в ДГА, МПа; $P_{вых}$– давление газа на выходе из ДГА, МПа. Т = t + 273=40+273=313 ^{0}С.

Объёмный показатель адиабаты:

$$k_v = \frac{\Sigma k_{vi} \cdot V_i}{100},$$

где V_i – объёмные концентрации компонентов газа, %.

***k_{vi}*– объёмный показатель адиабаты:** k_{v1}= 1,3144 – объёмный показатель адиабаты метана; k_{v2}= 1,1405 – объёмный показатель адиабаты этана; k_{v3} = 1,2181 – объёмный показатель адиабаты пропана; k_{v4} = 1,4192 – объёмный показатель адиабаты азота; k_{v5}= 1,2232 – объёмный показатель адиабаты углекислого газа; k_{v6} = 1,4085 – объёмный показатель адиабаты кислорода.

t – (10– 90)–температура газа на входе в ДГА, ^{0}С; $P_{вх}$– давление газа на входе в ДГА, МПа; $P_{вх}$– (0,5 – 5,5) – давление газа на входе в ДГА; $P_{вых}$– давление газа на выходе из ДГА, МПа; $P_{вых}$– (0,1 – 2) – давление газа на выходе из ДГА.

Массовый расход природного газа G, через ГРП, кг/с:

$$G = \frac{Q_к \cdot \rho_{см}}{3600} = \frac{1125 \cdot 0,709}{3600} = 0,222 \text{ кг/с}$$

где $Q_к$– расход газа, м^3/ч; $\rho_{см}$– плотность газовой смеси, $\frac{кг}{м^3}$.

$$Q_к = \frac{Q}{30 \cdot 24} = \frac{810000}{30 \cdot 24} = 1125 \text{ м}^3/\text{ч}$$

Номинальная располагаемая мощность $N_{ДГА}$, кВт, которая может быть получена при помощи ДГА:

$$N_{ДГА} = G \cdot H_{АД} \cdot \eta = 0,222 \cdot 193,1 \cdot 0,7802 = 33,45 \text{ кВт}$$

где G – массовый расход природного газа, кг/с; $H_{АД}$– перепад энтальпии, кДж/кг; η – общий КПД ДГА:

$$\eta = \eta_{ген} \cdot \eta_0 = 0,94 \cdot 1 \cdot 0,83 = 0,7802;$$

здесь $\eta_{ген} = 0,94$; $\eta_{мех} = 1$; $\eta_0 = 0,83$.

Результаты теоретического и экспериментального расчетов доли электроэнергии, выдаваемой в сеть, при использовании для подогрева газа воздушной ТНУ и давлении на входе и выходе станции технологического понижения давления 0,6/0,15 МПа представлены в табл.1

Таблица 1

Результаты теоретического и экспериментального расчетов

Параметры	**Расчетные данные**	**Данные эксперимента**	**% расхождения результатов**
Воздушная теплонасосная установка			
Теплота, полученная газом в теплообменнике подогрева газа перед ДГА, кДж/с	13,1	12,9	-1,53
Расход воздуха в контуре воздушной ТНУ, кг/с	0,127	0,125	-1,57
Мощность, потребляемая компрессором, кВт	14,99	15,22	+1,51
Детандер-генераторный агрегат			
Электрическая мощность, вырабатываемая ДГА, кВт	23,77	23,43	-1,43
Температура газа на выходе из ДГА, К	50,3	51,21	+1,81
Доля электроэнергии, выдаваемой в сеть:	0,375	0,368	-1,86

Годовая выработка электроэнергии ДГА:

$$W_{ДГА} = N_{ДГА} \cdot 0,24 \cdot \tau = 33,45 \cdot 24 \cdot 350 = 280980 \text{ кВт} \cdot \text{ч/год}$$

где τ- продолжительность работы ДГА в году; $\tau = 350$ дней.

Среднегодовой тариф на покупную электроэнергию

$$Ц_{ЭЭ} = 0,04\$/\text{кВт} \cdot \text{ч}.$$

Снижение затрат:

$$\Delta П_{ДГП} = W_{ДГА} \cdot Ц_{ЭЭ} = 280980 \cdot 0,04\$ = 11240\ \$$$

Таким образом, суммарный экономический эффект от внедрения рекомендаций по повышению энергоэффективности и ресурсосбережения технологии редуцирования газа составил одиннадцать тысяч двести сорок долларов в год.

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