In the article ecological activity is examined on a railway transport. Enterprises of railway transport are the substantial sources of contamination of environment. The problem of decline of their noci-influence on an environment must decide by means of approach of the systems, including эколого-экономический. Researches of the эколого-экономических systems on a railway transport began to be conducted only lately. System researches of the informative providing of the эколого-экономического monitoring are practically absent on a railway transport. It is necessary to confess that nature protection work on the railways of Ukraine presently remains the the least automated type of activity. Most operations of treatment of эколого-экономической information come true by hand, and introduction of the specialized computer programs carries episodic character.

The aim of ecological activity on a railway transport is development of scientific and practical bases of analysis of the systems of эколого-экономического risk of enterprises of railway transport and creation of the informative providing of management nature protection activity for railways. On the one hand, such a structure should bring together relevant environmentalists, and on the other hand, cover the main management of divisions and enterprises of the industry by adding to their job descriptions of additional functions, duties, rights and responsibilities for the practical implementation of environmental activities. This structure is called the "Department of Traffic Safety and Ecology". Currently, quite effective methods of wastewater treatment have been developed, as well as exhaust gases from diesel engines and various types of boilers. After appropriate research and development, they can be used in transport. That is why the primary task of environmental protection is wide implementation on the network railways of special treatment facilities and structures that will minimize environmental pollution. For example, the development of structures for the purification of exhaust gases from locomotives and boilers should begin today.

Keywords: railway transport, ecology, nature protection activity, environment, ecological policy.

Introduction. The Law of Ukraine "On Environmental Protection" (dated June 25, 1991, as amended on March 6, 1996) provides for the activation of activities of various sectors of the economy in the context of the conservation of natural resources and habitat for the benefit of present and future generations. The purpose of this law is to regulate relations in the field of protection, use and reproduction of natural resources, ensuring environmental safety, preventing and eliminating the negative impact of economic and other activities on the environment, conservation of natural resources, genetic resources of wildlife, landscapes and other natural complexes, unique territories and natural objects.

It should be noted at the outset that the railway transport of Ukraine in ecological terms is one of the relatively safe sectors of the national economy. For example, the share of environmental pollution by all modes of transport in the former USSR was 26.3%. At the same time, air pollution was distributed among the different modes of transport as follows: automobile - 7.0%, marine and river - 4.1%, railway - 9.2% [1]. Thus, the share of railways in environmental pollution is about 3.0% of the total pollution by transport and industry (combined), which is not so much considering the large stockpiles, the high volumes of transportation and the large number of workers in the rail industry. Today, the railway network pays a lot of attention to train safety, environmental work and epidemiological surveillance. However, the environmental status of many industrial centers of Ukraine has reached such a critical level when it becomes appropriate to put the words of the ancient Roman philosopher Seneca: "People do not die, they kill themselves." 4 million children and 18 million adults die annually as a result of water pollution in the world [2]. That is why the
problem of Ukraine's exit from the ecological crisis is a state priority [3].

Today, most of the major rail transport funds are morally outdated and subject to great physical wear and tear. As a result, one of the most important tasks of the industry is the timely replacement of these funds in the near future. It is not right to change outdated machinery, but it is advisable to introduce a new generation of technical means and technologies immediately. Therefore, the purpose of our article is to attract the attention of leading executives and specialists of the industry to the actual and perspective tasks of ecology. To transform rail transport into one of the most environmentally friendly sectors of the economy in the first decades of the 21st century, to contribute to the rehabilitation of the nature of the areas adjacent to the railways.

The term "ecology" was first introduced to scientific circulation in 1866 by E. Heckel, a supporter and follower of Charles Darwin. He defined ecology as a science that understands the relationship between organisms and the environment. Until the mid-70s of the twentieth century, it was known only to biologists (in various variants - plant ecology, animal ecology, ecology of groups, etc.). At the Stockholm International Congress on Environmental Issues in 1970, the words "ecology" and "ecologist" acquired new qualities. Today, we can say that the content and nature of ecology have changed dramatically over the last few years. It now exists in two positions: as a biological science in the traditional trade, and as a complex integral direction that integrates knowledge from the natural, social, engineering and other sciences. All of them are intended to ensure the optimal relationship of human activity with the environment [4].

From the standpoint of the teaching of Acad. VI Vernadsky about the biosphere and noosphere, ecology can be defined as the science of optimal control of the transition of the biosphere to the noosphere. Today in most developed countries and in Ukraine the basics of ecology in universities, schools and colleges are widely studied [5]. And scientific research in this area of knowledge occupies one of the priority places.

First of all ecology interacts (uses theoretical and methodological apparatus) with many other sciences and is divided into two main parts: general - scientific and methodological base and specialized - which contains the main functional and purpose areas of ecological activity, which are also divided into narrower ones. These areas of environmental activity, on the one hand, extend to many objects of different scales and sectors of the economy, and on the other hand - contain general scientific and methodological sections of ecology. Both areas use biological, chemical, physical, technical and technogenic (engineering) means of protection, control and environmental impact, and also pursue certain goals. Objects of different scale (and systems of different nature) may include the atmosphere, hydrosphere, flora, fauna and subsoil of the earth; manufacturing enterprises, jobs, various representatives of wildlife.

As a result of the spread of various types of environmental activities to the railway infrastructure, independent branches, areas and sections of ecology are formed (which usually cover specific issues of theory, methodology and practice). However, the final tree of environmental science requires a clear definition of the boundaries and content of each of its components, which requires more serious efforts by many scientists. The main thing is that not only today, but also in the future, ecology will expand more and more widely into different spheres of human activity and play a greater role in its life.

A systematic approach to solving the environmental problems of rail transport is extremely important. Specificity of the railway transport and especially a number of its environmental tasks make it expedient to allocate the ecology of railway transport in an independent direction. It should distinguish the following main sections: proper environmental activities; the industry's production and enforcement system, which includes objects and processes that pollute the environment and which will be subject to environmental protection and rehabilitation. This will allow to evaluate the efficiency of the industry, optimize environmental performance. Let us dwell on some of the most important areas of railway ecology.

Environmental management in the field of railway production and enforcement system in Ukraine is currently carried out by the medical and sanitary service and is reduced to a limited range of tasks that are solved, except for sanitary and epidemiological control on the railway infrastructure. For the intensification and more purposeful nature of environmental activities, it is likely to be correct to create in the long term an independent environmental service (or to transform the health service into a health care environment), which will include functions of sanitation, hygiene and epidemiological surveillance, what are the ecological surveillance [2]. That is why the question of creating a special organizational structure for environmental management at the scale of Ukrzaliznytsia (railways and branches) has been raised. On the one hand, such a structure should bring together profile environmentalists and, on the other hand, cover the core management of the departments and enterprises of the industry by adding to their job descriptions additional functions, responsibilities, rights and responsibilities for the practical implementation of environmental activities. This is the structure of the Department of Traffic Safety and Ecology.

The problem of the organization of protection and rehabilitation of the environment by rail is extremely important. Despite the relative well-being of rail transport in the field of ecology, it should be noted that it sometimes causes serious damage to the environment. Passenger cars annually emit more than 200 cubic meters per kilometer. m of sewage containing faeces containing pathogenic bacteria and up to 12 tons of
and the relevant components of the production system; relationships between all areas of environmental activity opportunities in nature protection and rehabilitation; environment, as well as in the analysis of tasks and their division by the degree of impact on the components of the production and execution system and process of joint practical implementation; functional interdependencies between them in the environmental activities, as well as in establishing and depth of analysis of all components is:

development of environmental activities in rail transport of services and amenities. of issues, ranging from passenger safety to various types corporate high-speed trains, which covers a wide range comfort of passengers in both conventional and also to improve and restore the natural environment. For example, it is already necessary to take additional measures not only to protect them, but others alive organisms »[6].

Currently, sufficiently effective methods of wastewater treatment, as well as the exhaust gases of diesel engines and various types of boiler rooms, have been developed. After proper research and development, they can be used in transport. That is why the priority of environmental protection is the widespread introduction of special treatment facilities and structures on the rail network, which will minimize pollution of the environment. For example, it is already necessary to begin designing structures for the cleaning of flue gas from diesel locomotives and boiler rooms.

Today, many land adjacent to the railways have reached such levels of pollution that it is necessary to take additional measures not only to protect them, but also to improve and restore the natural environment.

Another important objective is the environmental comfort of passengers in both conventional and corporate high-speed trains, which covers a wide range of issues, ranging from passenger safety to various types of services and amenities.

The idea of a systematic approach to the development of environmental activities in rail transport is:

- in ensuring the completeness of the identification and depth of analysis of all components of environmental activities, as well as in establishing functional interdependencies between them in the process of joint practical implementation;
- in timely identification of all informative main components of the production and execution system and their division by the degree of impact on the environment, as well as in the analysis of tasks and opportunities in nature protection and rehabilitation;
- in establishing information links of functional relationships between all areas of environmental activity and the relevant components of the production system;
- in building a tree of goals (performance criteria with their quantitative characteristics and objective optimization functions) and coordinating environmental activities to successfully achieve these goals.

The further task of the research is a deeper detailing and analysis of the dependencies between all components of the system model for the formation of rational (optimized) environmental policy, as well as program-targeted management of its implementation, taking into account the parallel innovative progress of the industry and socio-economic development of its infrastructure.

The main content of environmental activities in rail transport is:

- environmental management of railway transport;
- development of scientific and methodological bases of environmental protection;
- prevention and elimination of environmental disasters;
- organization of environmental protection and rehabilitation by rail.
- each of these divisions is divided into several separate directions. List the last in the order of citation.

1. The environmental management of rail transport covers 5 areas:
   a) regulatory framework of environmental activity in rail transport;
   b) organizational structure of environmental management at the scale of Ukrzaliznytsya and six Ukrainian railways;
   c) system of planning, coordination and promotion of environmental protection works;
   d) financing and logistical support of works;
   e) management of interbranch and interstate environmental activities.

2. Development of scientific and methodological bases for environmental protection includes:
   a) systematic approach to solving environmental problems of railway transport and its infrastructure;
   b) justification of new environmental norms and standards for railway transport;
   c) development of mathematical apparatus (models) for risk assessment of environmental disasters;
   d) development of economic models and methods for assessing the effectiveness of environmental measures;
   e) applied scientific research on technical measures and technologies for environmental protection.

3. The prevention and elimination of environmental disasters shall include:
   a) improvement of the system of control over promotion, conservation, etc. environmentally dangerous goods;
   b) optimization of the technology of work on the prevention of environmental catastrophes in the railway transport;
   c) optimization of the technology of work on the prevention of environmental catastrophes by rail;
   d) optimization of logistical support of the system of elimination of ecological catastrophes.

4. The organization of environmental protection and rehabilitation by rail shall include:
   a) environmental assessment and certification of enterprises and territorial zones of railway transport;
   b) organization of environmental monitoring on railway transport and its infrastructure;
c) development and implementation of environmentally friendly rail transport facilities and technologies;
d) development of environmental expertise of projects;
e) development and implementation of measures for environmental protection and rehabilitation.
5. Interaction of railway with adjacent branches of regions includes:
a) cooperation of resources and means for elimination of ecological disasters in regions (districts);
b) cooperation of resources and facilities for regional environmental monitoring;
c) joint planning and implementation of regional environmental measures.
6. Training and use of ecology personnel in transport:
a) training of professional ecologists for railway transport at the universities of the Ministry of Education and Science of Ukraine;
b) enhancement of ecological preparation of students from all specialties in all universities of the Ministry of Education and Science of Ukraine;
c) organization of environmental training for scientific and technical workers and managers of railway enterprises;
d) the creation of full-time positions and additional functions of environmental managers.

Particularly noteworthy is the increasing contribution of the industry to improving the nature of Ukraine:
1. Transportation, storage, loading and unloading of cargoes (including environmentally dangerous).
2. Passenger transportation (safety, environmental comfort, etc.).
3. Train movement, track economy, rolling stock, electricity supply.
4. Railway undertakings and labor protection.
5. Residential settlements (zones, quarters) and railway infrastructure.
6. Other sectors of the economy adjacent to the railways.
7. Environment of railways.
8. Life, health and longevity of people, prevention of infant mortality.
9. Environmental costs of environmental measures.
10. Economic losses from environmental pollution.
11. The price of pollution (or cleanliness and health) of the environment.
12. The likelihood of environmental disasters.
13. Favorable working, living and resting conditions.

All listed criteria for increasing the contribution of railway transport to the improvement of nature of Ukraine form the general goals or criteria:
A. Saving people's lives and health, increasing their life expectancy.
B. Improving the cleanliness of the environment by rail.

B. Increasing the socio-economic efficiency of environmental activities.

Taken together, this contributes to the development and implementation of a comprehensive target program for the development of environmental performance in rail transport and environmental health.

The question of the place and role of rail transport in national environmental policy is extremely important.

Scientific research has shown not only the feasibility and importance of a comprehensive cross-sectoral solution to environmental, regional problems, but also the enormous opportunities for rail transport, which include:

- the use of technical means and the scientific and technical potential of the industry in a permanent environmental monitoring system (communication facilities, computing center for the processing and analysis of static and operational information, automated environmental control points, etc.);
- in the complex formation of environmental policy in the state together with the administration of Ukrzaliznytsia and enterprises of other branches, as well as in the rational cooperation of forces and resources (financial, transport, construction, scientific and technical, etc.) for coordination and more effective implementation of measures and protection and rehabilitation environment.

- in the cooperation of forces and resources to create a highly efficient system for prompt elimination of the consequences of environmental disasters.

Many of the listed areas of work also apply to all types of transport, which is supposed to be taken into account when coordinating these works on the basis of Ukrzaliznytsia. National activities should be developed in accordance with the strategic recommendations of the Ministry of Natural Resources of Ukraine and close contact with the units of the Ministry of Emergency Situations, especially in the context of disaster relief.

It is not only necessary to take measures to strengthen the environmental protection of rail transport, but also to provide assistance for their rehabilitation (replacement of polluted soil layers, expansion of plantings of green space, enhancement of ecological culture of the population, etc.), which is fully supported by railway companies. It is also important to improve environmental norms and standards and to bring our norms into acceptable air and water pollution to those in developed countries.

During the years of its existence, the sanitary and epidemiological service of the railways not only fulfilled its tasks, but also made a great contribution to the preservation of the health and efficiency of many people. It is the turn of the day on new environmental challenges for the industry that are no less relevant today than the fight for the hygiene and health of its workers in previous years. It is obviously time when the centers for sanitary and epidemiological surveillance are gradually transformed into railway ecological centers (Centers for ecological surveillance and management), expanding their functions, rights and conformity
accompany their activities in the field of industrial communal ecology. At the same time, it is necessary not only to strengthen their existing material and technical base, but also to supplement it with new personnel composition of professional ecologists. Technical means of ecological monitoring, etc. After all, one of the main tasks of the top management of the railway industry and railways is to create the well-being of the environmental conditions of work, life and recreation of their workers, which are directly responsible for all transport labor.

Thus, in the process of shaping and planning railway environmental policy, one of the most important issues is the choice of the most effective measures and the rational sequence of their implementation in terms of scarce resources and funding.

**Reference**


**Literatura**


Пилипчук О.Я. Екологічна діяльність на залізничному транспорті: її суть, актуальні завдання, місце і роль в загальнодержавній екологічній політиці України

У статті розглядається екологічна діяльність на залізничному транспорті. Підрозділи залізничного транспорту є істотними джерелами забруднення довкілля. Проблема зниження їх негативного впливу на навколишнє середовище полягає в розв’язанні завдань, які включають екологічно-економічні. Досліджувався екологічно-економічний систем на залізничному транспорті почали проводити лише останнім часом. Система дослідження інформаційного забезпечення екологічно-економічного моніторингу практично відсутня на залізничному транспорти.

Ці результати наводять на їх проробку на залізницях України. В даному часі залізніці необхідно виконувати пошук автоматизованих систем, які можуть забезпечити стаціонар залізничного транспорту і створення інформаційного забезпечення управління природоохоронною діяльністю залізниць.

Пилипчук О.Я. Екологическая деятельность на железнодорожном транспорте: ее сущность, актуальные задачи, место и роль в общегосударственной экологической политике Украины

В статье рассматривается экологическая деятельность на железнодорожном транспорте. Предприятия железнодорожного транспорта являются существенными источниками загрязнения окружающей среды. Проблема снижения их негативного влияния на наволожнное среду должна решаться посредством сближения систем, в том числе экологогэкономического. Исследования эколого-экономических систем на железнодорожном транспорте сталя проводиться только в последнее время. Системы исследования информационного обеспечения эколого-экономического мониторинга практически отсутствуют на железнодорожном транспорте. Необходимо признать, что природоохранные работы на железнодорожных дорогах Украины в настоящее время остаются наименьшем автоматизированным видом деятельности. Безнапряженная операция обработки эколого-экономической информации осуществляется вручную, а внедрение специализированных компьютерных программ носит эпизодический характер.

Целью экологической деятельности на железнодорожном транспорте является разработка научных и практических основ анализа систем экологоэкономического риска предприятий железнодорожного транспорта и создание информационного обеспечения
управління природоохоронною діяльністю залізних доріг.

С одної сторони, така структура дозволяє об'єднувати відповідних екологів, а з іншої - об'єднувати їхні обов'язки и функції. Так, наприклад, екологи, які обслуговують залізницю, можуть також забезпечувати захист природи в межах діяльності залізниці.

В наступному періоді плановий план діяльності залізниці включає в себе такі напрямки, як знищення забруднень від транспортних засобів, екологічночиста діяльність та інші.

**Ключові слова:** залізничний транспорт, екологія, природоохорона, охорона середовища, екологічна політика.

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