

Svitlana I. Zapara¹, Viktoriya V. Strelnyk²
ENVIRONMENTAL MANAGEMENT SYSTEM:
MINING COMPANY CASE STUDY

The article considers the need to introduce the environmental management system at mining enterprises since environmental factors have their significant influence on economic restructuring and modernization. This issue gains particular importance within the strategic course of Ukraine's eurointegration.

Keywords: environmental management; ISO standards; national standards; mining sector.

Peer-reviewed, approved and placed: 18.04.2016.

Світлана І. Запара, Вікторія В. Стрельник
СИСТЕМА ЕКОЛОГІЧНОГО УПРАВЛІННЯ:
НА ПРИКЛАДІ ГІРНИЧОГО ПІДПРИЄМСТВА

У статті розглянуто необхідність впровадження системи екологічного управління на гірничому підприємстві. Доведено, що екологічні фактори суттєво впливають на структурування й шляхи модернізації економіки. Це питання набуває особливої ваги в рамках стратегічного курсу України на євроінтеграцію.

Ключові слова: екологічне управління; стандарти ISO; національні стандарти; гірнична галузь.

Рис. 1. Табл. 1. Літ. 21.

Светлана И. Запара, Виктория В. Стрельник
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В статье рассмотрена необходимость внедрения системы экологического менеджмента в горнодобывающей компании. Доказано, что экологические факторы существенно влияют на структурирование и пути модернизации экономики. Данный вопрос приобретает особое значение в рамках стратегического курса Украины на евроинтеграцию.

Ключевые слова: экологическое управление; стандарты ISO; национальные стандарты; горнодобывающая промышленность.

Problem statement. Today's environmental policy of Ukraine is declaring country's intentions for harmonization with the EU policies, however, its actual implementation and key tasks set are rather far from good performance indicators, especially when it comes to industrial development and mining in particular. Obvious imperfection of contemporary methods and forms of environmental planning in the field of subsoil management hampers the mining sector development and makes national minerals extraction less competitive at the international level (Hetman et al., 2014).

Today there is an obvious necessity for introduction and implementation of the national strategic concept of public management in the subsoil use sectors (Golovkin, 2010). For its efficiency and high performance public authorities have to reject straight from the very beginning the use of traditional, known from the Soviet times, methods and tools of the command-administrative system. Public bodies have to develop efficient cooperation with subordinate structures and units at the local level and delegate them a significant share of responsibilities for more efficient subsoil use.

¹ Sumy National Agrarian University, Ukraine.

² Yaroslav Mudryi National Law University, Kharkiv, Ukraine.

Recent research and publications analysis. Problems of environmental management in the subsoil use sector have been studied by quite a wide range of authors, including the following Ukrainian scholars: I.D. Andrievskiy (2004), B.M. Danylyshyn et al. (1999), M.M. Korzhnev et al. (2000), O.V. Plotnikov (2002) and obviously some others too.

Despite a number of studies on the problem in question, the issue of environmental management at the level of mining enterprises is insufficiently explored given a particular importance in the context of Ukraine's new strategic course on eurointegration.

The research objective is to substantiate the urgent need to introduce the environmental management system at the mining enterprises in Ukraine.

Key research results. Changing priorities and goals in management, the shift from centralized administration by public bodies to market economy, privatization of the vast majority of enterprises lead to ever increasing role of environment management at enterprises. Taking into account the significant environmental load from mining enterprises, environmental management at the enterprises' level becomes vital, since modernization and restructuring of national economy as such depends on environmental factors significantly.

Mining enterprises are always the objects with increased level of insecurity and the key source of man-made load on the environment. This is why environmental management at a particular production venue must be adjusted to the level of potential industrial insecurity of a particular enterprise. And the contents of such environmental management is predetermined by natural resources which are particularly threatened by the activities of enterprises.

For Ukraine this is still an unsolved problem: how to organize continuous support for the necessary quality level of environmental protection? This preconditions the need for environmental security provision at production by means of technical and technological re-equipment of mining enterprises. At this, the environmental factor has to be taken into account in all aspects of production activity.

Every mining enterprises must have a system for internal environmental control (SIEC). SIEC serves as a component in a wider system of environmental management which has a specific organizational structure, its own planning, documents circulation, methods and procedures, own set of resources necessary for efficient control over enterprise's compliance to the general environmental criteria set in the sector (Gaponenkova, 2003: 65).

Today's common trend in legal regulation of enterprises' activities overall and in subsoil protection specifically is that administrative burden is to be reduced and all enterprises are to be given more independence in their production choices (Law of Ukraine, 15.12.2009, # 1759-VI).

For example, industrial enterprises with wastes and emissions, regardless their ownership form and/or administrative reporting, are obliged to perform the inventory of polluting emissions. According to the Law of Ukraine # 1264-XII, Article 31 (25.06.1991) and Law of Ukraine # 2707-XII, Article 4 (16.10.1992), rate setting in the field of air protection is to be carried out in order to set the mandatory rate, rules and requirements concerning atmosphere protection.

Before 2007 all wastes inventory works had to be carried out only by specialized organizations. Today these works are carried out independently by economic subjects directly (the latest legal update on this – the Decree of the Ministry of environmental protection..., 14.11.2007, # 569).

Thus, as of today Ukrainian legislation does not state that organizations and institutions performing the inventory of environmental wastes should be registered. And all these inventory works are being done very much independently. In case an enterprise does not have a specialized laboratory for such works, third-party organizations can be involved but they must be accredited for such laboratory tests.

Also, enterprises often simply do not have enough expertise in inventory activities related to wastes, thus, they have to delegate this to third parties. However, at this enterprises have enough freedom to choose a contractor. And at the same time it is the ordering enterprise who is responsible for the results of such inventory works.

The role of controlling function at a mining enterprise must be considered in more general context of environmental management. During the decades, unfortunately, the common practice has been getting permits for separate elements of the environment. The decisive factor at this must be guaranteeing the conditions at which the actual pollution of the environment does not go over the threshold line.

Separate regulation on atmosphere, grey waters and solid wastes storage by mining enterprises lead to the situation when pollution is being transferred inbetween the segments of the environment, which actually goes against the principle of environment protection as such.

Environmental evaluation of the production processes' efficiency within the framework of production environmental management has to be performed based on measures and/or calculations of the emissions' level, and also, taking into account the actual volumes of used natural, energy and other resources.

Owners of mining enterprises must be aware of the inevitable responsibility, both moral and legal, in front of the whole surrounding community for their enterprise's impact on the environment.

For practical implementation of production environmental management newer economic instruments would be necessary as well as truly radical changes in the essence and approaches to production activities.

SIEK has to maintain company's performance by means of assisting its development and improvement of environmental management through the development of the most efficient environmental policy for a particular enterprise as a subsoil use subject.

For implementation of environmental management at any production it would be necessary to introduce certain rules (norms, standards) which would serve as the basis on which an enterprise is able to assess its own performance, its general level and correctness of specific tasks performed. A good example in this context is the series ISO 14000 which is probably the most meaningful international environmental initiative as such since it allows shaping and updating the environmental policy of any industrial enterprise.

The general strategy of these standards is constructing the appropriate organizational structure for further distribution of responsibility between separate production units within (Gaponenkova, 2003: 80).

Development and wide spread of ISO 14000 series abroad is explained by the severity of environmental legislation and general unification of rules and standards in trade, credit and financial policies (ecolabel.org.ua).

In Ukraine since January, 1st, 1998 5 international standards of ISO 14000 related to environmental management and ecological audit are given the status of state standards. However, they are still treated as voluntary, not mandatory. The system of ISO 14000 series cannot be treated as legislative acts since they are not mandatory, but still enterprises follow them on the voluntary basis.

In 2006 Ukraine introduced the new national standards which were replacing the standards of the 2008 version (Table 1).

Table 1. National standards, compiled by the authors

National standards of 2006	Standards of the 1998 version
DSTU ISO 14001:2006 Systems of environmental management. Requirements and rules of its application (ISO14001:2004)	Instead of DSTU ISO14001-97 Administrative instructions on environmental audit performance. Audit procedures. Audit of the system of environmental protection management (www.budinfo.org.ua)
DSTU ISO 14004:2006 Systems of environmental management. General grounds concerning principles, systems and means of maintenance (ISO 14004:2004)	Instead of DSTU ISO 14004-97 Systems of environmental protection management. General framework of principles, systems and means of maintenance

Note: DSTU states for State Standards of Ukraine, local acronym in Ukrainian.

In the list of Ukrainian enterprises certified according to ISO 14000 it will be hard to find those which managed to carry out the introduction stage by their own means. The cost of international certification procedures, according to the information of Burea Veritas Ukraine, for small business would be several thousand USD, while for large enterprises it may reach 20 ths USD.

The very first Ukrainian enterprise to get the international certificate of environmental management according to ISO 14000 was Concern "Stirol" from Horlivka, Donetsk oblast. "Stirol" is a vertically integrated diversified company which operates by European standards of corporate governance and according to European approaches to quality. This concern managed to go all the way from official declaration of quality standards compliance to getting the international certificate in 2 years (ecolabel.org.ua).

This decision – to convert to environmental management according to ISO 14001 at Concern "Stirol" – was dictated by their top management's aspiration to have highly efficient and competitive enterprise producing and selling mineral fertilizers of the highest quality.

The concern also applied for participation in competition for one-year partner grant EcoLinks. This is a cooperation programme for Central and Eastern Europe financed by the USAID. The obtained grant in the amount of 49 ths USD covered only a minor part of spending on the development and introduction of the environmental management system according to ISO 14001.

Employees responsible for quality at the concern have studied the experience of American companies in the field of environmental management: "Nissan Motor Manufacturing Corporation" (automobiles' production); "Bridgestone / Firestone

Inc" (tyres plant); "Reichhold, Inc." (chemicals production); "ChemFirst Fine Chemicals"; "P.H. Glatfelter" paper mill (detailed data available on the Concern's official site – stirol.ostchem.com).

The grounds for the introduction of ISO 14000 at Concern "Stirol" became the quality management system which is in compliance with ISO 9000 (Shutenko, 2004).

In the process of certification the enterprises of the concern had 638 aspects to consider, of them – 17 were significant, including in particular: combustion gases pollution; nitrogen oxide emissions and emissions of other chemical types; irrational use of water and natural gas; depressurization etc.

Today the economic effect from the introduction of environmental management system at Concern "Stirol" is achieved through: electricity saving; economy on heating, water and raw materials; using energy-saving technologies and closed circles of water circulation; waste reduction and waste reprocessing (www.ecolabel.org.ua).

An important result from application of the approaches of "constant improvement" and "pollution prevention" is that an enterprise, after getting the certificate by national standards, still must keep on working on further improvement of its environmental management in order to reduce the environmental load further.

Thus, implementation of the environmental management system according to ISO 14000 enabled Concern "Stirol" cut waste water pollution in the Donbass region and also reduce fourfold atmosphere emissions, set new production lines which are zero waste. In this way the enterprise has moved to the next level in environment problems regulation and still keep on investing in environmental protection measures.

The major negative environment consequences from mining activity are: atmosphere pollution; land subsidence; increased level of subsoil waters; emergence of flooded zones and waterlogging areas; decreased quality of the local agricultural and forestry lands; land pollution; pollution of subsoil and open waters etc.

Considering this, all mining enterprises must develop and maintain in a working condition the programme and the methods of environmental protection management, and they also must determine and delegate the responsibilities within this system, so that top management is able to get control information in a timely manner.

Another example of the environmental management system introduction according to DSTU ISO 14001:2006 is "Ukratnafta". Higher level of industrial security at "Ukratnafta" is achieved by means of better technological discipline, corresponding environmental control, effective prevention work etc. – all of this enable the systemic approach to processes management at the enterprise, and thus, promote higher production efficiency (Figure 1).

Same responsible attitude to the environment through the introduction of the certified system of environmental management according to ISO 14001:2004 was also demonstrate by another industrial giant – "ArcelorMittal Kryvyi Rih".

This is one of the largest mining enterprises of Ukraine with the full metallurgy cycle, including coke-chemical and mining-processing production, mine administration and metallurgy production.

This complex spends annually from 12% to 17% of its total investments on technical re-equipment related to nature protection and environmental management.

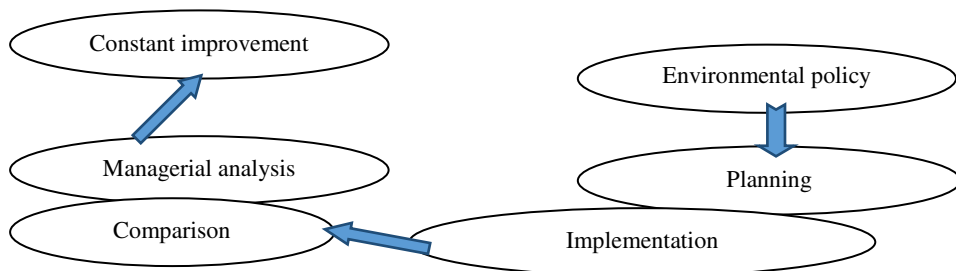


Figure 1. The model of environmental management system, according to (DSTU ISO 14001:2006)

This enterprise applies ISO 14001:2004 standards in its development and also procedures which enable early detection of potential emergency situations. In this way the enterprise is able to prevent the events which would be harmful for the environment.

It is worth noting here that worldwide ISO standards of the 14000 series are voluntary, and thus, this is the task for the state – to create such conditions which would motivate domestic enterprises introduce environmental management systems according to ISO 14000.

The results from ISO 14000 standards application in environmental management in Ukraine would be manifested through the updated environmental indicators which are part of investment attractiveness of any enterprise. In this, the state must promote the implementation and organization of environmental management system by providing certain preferences for already certified enterprises, namely, in public procurement contracts.

For the efficient functioning of the environmental management system based on ISO 14000 we find expedient to introduce new legal regulations which would oblige all mining enterprises to have a special environmental office/department. Since overall, environmental management at the state level is always based primarily on legal requirements to industrial production objects.

In this regard experience of the EU countries may be useful for Ukraine since many European countries, for example, have requirements to the companies that supply products for government necessities. They must have the certificate of compliance with ISO 14000 or EMAS (Eco-Management and Audit Scheme), according to the EU Directive 1836/93.

Conclusions. The key element in reducing the anthropogenic and technogenic load on the environment is to introduce changes in the current environmental practices of production activities.

In order to stimulate producers' participation in solving of environmental problems it would be also feasible to introduce the mechanism stimulating enterprises to implement environmental programs and projects. In this regard it would also appropriate to suggest a mechanism distributing responsibility between public authorities and private enterprises for potential environmental losses, taking into account the environmental factor while defining the cost of enterprises which are subject to privatization.

In order to widen the area of the related national standards application changes would be necessary to be introduced into the Law of Ukraine "On Environmental Audit" (24.06.2004, #1862-IV) concerning the enterprises involved in public procurement projects. All of them must have the certificate of compliance with ISO 14000.

Also, in the context of state support for entrepreneurship development the following regulation within the state projects competition rules would be feasible to introduce: to codify the requirement under which upon all other conditions being equal, the preference is given to those enterprises which are certified according to DSTU ISO 14000.

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