the connotation of a crisis, which was never intended by the ICRP. Furthermore, the word 'group' may be confusing in the context where the assessed dose is to an individual [3].

The ICRP now recommends the use of the 'Representative Person' for the purpose of radiological protection of the public instead of the earlier critical group concept. This term is the equivalent of, and replaces, 'average member of the critical group' described in previous ICRP recommendations [1]. In addition, the International Atomic Energy Agency in the main Radiation Safety Document [2] has used the term representative person to compare with the reference levels of exposure.

In considering dose to the representative person, a number of factors should be taken into account: (1) the dose assessment must address all relevant pathways of exposure; (2) the dose assessment must consider spatial distribution of radionuclides to ensure that the individuals receiving the higher exposures are included in the assessment; (3) habit data should be based on the population exposed and must be reasonable, sustainable, and homogeneous; and (4) appropriate dose coefficients have to be applied to specific age categories. Once these factors are taken into account, and depending on the assessment approach employed (deterministic, probabilistic, or a mixture of these), the representative person is identified and used to determine compliance. Additional elaboration follows on each of these factors.

Table

Summary of methods used for determining dose to the representative person

	Calculation method	
	Probabilistic	Deterministic
Environmental concentration data	Distribution of estimated or measured concentration (activities in environmental objects and foods)	Single values for parameters
Habit data	Range or fixed values for habit data	Average value for the highly exposed group or 95th percentile of appropriate national or regional data
Dose coefficient	Fixed value based on age	Fixed value based on age
Dose to the representative person	Method selected by operator or regulator. Representative person is identified that the probability is less than 5 % that a person taken at random from the population will receive a greater dose	Product of above values

BIBLIOGRAPHY

1. ICRP, 2006a. Assessing dose of the representative person for the purpose of radiation protection of the public and the optimization of radiological protection: Broadening the process. ICRP Publication 101. Ann. ICRP 36(3).

2. Radiation protection and safety of radiation sources: international basic safety standards: general safety requirements. / GSR Part 3 – Vienna: International Atomic Energy Agency, 2014. – 471 p.

3. The 2007 Recommendations of the International Commission on Radiological Protection. / ICRP Publication 103. Ann. ICRP 37 (2-4) – ICRP, 2007. – 423 p.

MODERN ENVIRONMENTAL PROBLEMS – THEIR CAUSES AND MANAGEMENT

U. Kapitsa

Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
v_kapitsa@iseu.by

The modern environmental problems previously are result of anthropogenic impact to environment. Gas emissions, wastewater and waste are polluted environment and has effect to as biodiversity as human wellbeing. Landscape change and intensification in industrial and agricultural soil treatment also has influence to environmental quality. Environmental management tools are the main means for environmental problems control.

Keywords: environmental problems, anthropogenic impact, emissions, wastewater, biodiversity, waste, environmental management.

Modern world has a lot of environmental problems which are result of natural and artificial impacts. Some of them are caused by the influence of solar activity, which is cyclical in nature. Extreme weather events are often the result of it's impact. Another are result of volcanic activity.

Anthropogenic activity is the cause of most environmental problems in the modern world. Developed industry, transport, agriculture and the energy industry cause excessive consumption of natural resources and environmental pollution. As a result, the habitat of plants and animals is destroyed, the natural cycles of substances are disrupted, and substances appear in them that are toxic to living organisms.

Environmental management is a systematic approach to managing anthropogenic impact on the environment. At the state level, it consists of administrative, economic and information tools. Administrative tools in the use of natural resources imply the existence of environmental legislation, environmental regulation, environmental permits, licenses for environmental management, restrictions on the environmental impact from anthropogenic activity, environmental certification and standartisation [1].

Environmental management's economic instruments are represented by environmental taxes, fines, environmental insurance, quota markets and other market instruments that make it possible to financially interest businessmen to reduce the impact on the environment and rationally use natural resources and energy [1].

Scientific research ecological interaction in environment and implementation this knowledge to practice also allowed decrease anthropogenic impact to environment. For example Integrated Pest Management system allowed to permits high yields of ecologically safe products to be obtained and decrease environmental pressure in agriculture [2].

BIBLIOGRAPHY

1. Environmental protection / O. I. Rodzkin, U.N. Kapitsa. – Minsk: Belarus, 2010. – 160 p.
2. Reducing the Impact of Agriculture and Horticulture on the Environment / U. N. Kapitsa. – Ecosystem Health and Sustainable Agriculture – 2010. – V. 1. – P. 202–205.

CALCULATION OF COEFFICIENT OF HIDDEN LEAKAGE IN THE WATER SUPPLY NETWORKS OF SUBSCRIBERS

A. Kashuba, U. Ivaniukovich

Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
kasha.alexey@mail.ru

The algorithm and software for calculating the coefficient of hidden leakage in the water supply networks of subscribers, which takes into account the water supply networks of sub-subscribers, has been developed, which generates cost estimates for additional agreements with subscribers of the UE Minskvodokanal.

Keywords: UE "Minskvodokanal", water supply networks, hidden leakage factor, algorithm, ASP.NET, MS SQL SERVER, C #, JAVASCRIPT.

The relevance of this work is that it proposes software to improve the efficiency and accuracy of the work of the organization that still uses methods and means to calculate leakage elimination that do not include software.

The aim of the work is to develop a system for calculating the coefficient of hidden leakage in the water supply networks of subscribers, taking into account the water networks of sub-consumers.

When developing the software, ASP.NET, CSS, C #, JavaScript have been used. The system includes a database, which is accessed through Microsoft SQL Server Database File. Uninterrupted migration of data on the coefficient of hidden leakage in the water supply networks of subscribers from the implemented system to the directory on leakages and unaccounted water expenditures has been developed. The application provides for logging the history of operations of each user with data: entering, changing, deleting, and formatting the report.

The application calculates and provides data on the coefficient of hidden leakage in the water supply networks of subscribers, and also allows the printing of an additional agreement to the contract for the provision of water supply services with the calculation of data on leakages and unaccounted water costs in accordance with the data of the water supply networks of subscribers. The system generates forms of additional agreements with calculation calculations for the entered templates and printing them for the subscribers of the enterprise. The main reporting form is the calculation of the coefficient of hidden leakage values in the water supply networks for each selected subscriber.