METHODS AND LATEST TECHNOLOGIES ALLOWING TO REDUCE EMISSIONS OF THE HREBINKA LOCOMOTIVE DEPOT INTO THE ENVIRONMENT

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Hrebinka Locomotive Depot specializes in the operation and repair of railway locomotives. The depot belongs to the mixed type ,1st class. Today the company performs technical inspection of TO-3 and current repairs of PR-1 electric trains of series ER9M and EPL 9T. The depot performs operational work on the sections Hrebinka - Darnytsia, Hrebinka – Romodan - Poltava (Kyiv) by electric traction; on the sections Romodan - Kremenchuk, Hrebinka - Nizhyn - Bakhmach by diesel traction.

The locomotive depot has its own equipment park. Equipment includes fuel depots, equipment for the supply of locomotives and electric locomotives with fuel, sand, water and lubricants. The area where the technical means of park management are located has the necessary development. A variety of machine vision technologies detect thousands of track defects each year, which can potentially lead to accidents.

The conducted identification revealed the main pollutants and environmenta hazard classes:

– air emissions from stationary and mobile sources (the main source of pollution is a production boiler room, a kiln for drying sand);

– soil pollution occurs due to mobile sources (locomotives), placement of petroleum products in the fuel depot;

– the main source of waste generation and management is scrap ferrous and non-ferrous metals (hazard class 3), waste oils (hazard class 2), spent lead batteries (hazard class 1).

The direct impact on the company's employees is related to used oils, work with hazardous waste, and lead-acid batteries. The following technological processes are also dangerous: cleaning parts using chemicals; equipment painting; welding works; processes of applying protective anti-corrosion coatings; metal processing. In all these processes, the release of harmful substances is inevitable, but, as a rule, their increased formation is associated with non-compliance with technology or inept use.

Every responsible entrepreneur must plan and conduct their activities in the context of maintaining environmental safety. This context includes reducing the man-made impact of the enterprise on the environment, waste disposal, planning for the rational use of limited and non-renewable resources and the reproduction of renewable, as well as other factors related to the nuances of a particular business. Simply put, an environmentally responsible enterprise must work in such a way as not to cause direct or indirect damage to the environment.

In order to prevent and prevent the deterioration of the environment, economic activities are assessed for their impact on the environment and human health.

Depending on the type of business activity, factors such as the current state of the natural environment of the area where the activity is carried out or planned, ecological capacity, ecological forecast and prospects of social and economic development of the region, aggregate impact, capacity and type of harmful factors are taken into account.

The BNSF Class I railway began to use machine inspection systems (MVS) together with a network of track sensors to reduce identifiers on the railway association and disruptions. New technology offers the benefits of speed, reduced track occupancy, frequency and sequence of inspections. The equipment is installed on conventional trains , so ther is no need for an additional special car.In addition, checks can be performd at normal speeds.

At the Hrebinka locomotive depot the VL80k № 019 electric locomotive was modernized by the Orion RV-4 radio station operating in the HF and VHF bands, which allows to keep in touch with both the train foreman and the conductor crew and the locomotive dispatchers and station attendants.

In order to improve the technology of diesel repair, a stand was purchased to determine the actual tension of the crankshaft bearings. Also on the basis of the frame of the longitudinal planing machine, equipment for checking the deflection and steppedness of the crankshaft root necks has been designed.

In the conditions of the depot there is a machine for polishing the necks of the crankshafts, which is equipped with a movable bracket for fixing the flaw detector. Polishing technology eliminates roughness and scratches of the root and connecting rod necks.

The goal of clean production is to use industrial technologies and products that prevent air, water and land pollution, as well as reduce production waste and minimize the threat to human life and the environment. Clean production can be used in technologies used in any industry, as well as in the industrial products themselves.

Among the ideas of environmental improvement of the railway are considered and planned options, but this requires funding. There is a need to reconstruct the maintenance points of electric trains. Legal regulation of emissions and obtaining sanitary rules and regulations has been established. Compliance checks are carried out in the locomotive depot; the information was publicly available.

Currently, the following measures are implemented in the locomotive depot to reduce the impact on the environment:

– a modern boiler house with lower emissions of harmful substances into the atmosphere was built;

– a site for the storage of scrap metal has been arranged;

– electrification of the Hrebinka-Pryluky section is planned and implemented.

Thus, in the Hrebinka locomotive depot, measures are being taken to reduce the impact of the transport enterprise on the environment, within the limits of organizational and financial capabilities at the present time.

The experience of domestic and the largest foreign companies shows that the implementation and support of the environmental management system, environmental certification, the use of ecological labeling and the transition to organic production

bring certain benefits and advantages in the near future, and at the same time preserve the environment for future generations.

THE USE OF PLANT ORGANISMS IN MONITORING STUDIES OF URBANIZED ECOSYSTEMS ENVIRONMENTAL PROBLEMS

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Nowadays the rapid processes of urbanization and technogenesis have led to an increase in the number of pollutants in all areas of the environment – soil, water and air, and at the same time – in living organisms, causing a deterioration in their living conditions and even death. Acid rains, oil spills, and the accumulation of heavy metals in the environment are among the main pollution-related environmental problems of urbanized areas. Timely detection of negative changes in the ecological situation of populated areas is possible on the basis of research on the reactions of plant systems that directly exist in these areas. Coniferous, deciduous grass species, as well as herbaceous plant species are used as phytoobjects. The wide natural distribution of plants in urban ecosystems makes them the most accessible for biomonitoring analysis. At the same time, the analysis of the vital state of urban ecosystems vegetation can be carried out at all levels of biological organization – from molecular to population-species level. Ecological monitoring of urban areas involves the use of analytical, or physico-chemical, and biological research methods. From an economic and ecological point of view, biological methods of assessing the quality of the surrounding environment are more promising, since they allow to reveal the vitality of biological systems in specific conditions of existence, to single out the most informative bioindicators, and also to analyze the level of contamination of the abiotic environment.

Among living organisms, plant and animal systems, lichens, fungi and bacteria are used to indicate the state of the environment. Plants are one of the most convenient biological indicators, because they perform the function of primary producers of oxygen and organic matter in ecosystems, absorbers of urban industrial emissions, are immobile and therefore do not require additional manipulation and care during their study, respond sensitively to various stress effects and can serve objects of biomonitoring for an almost unlimited period of time [1].

Phytoindicative studies are conducted according to various principles, among which the method of functional zoning of the urbanized area is very popular. According to it, the experimental area is divided into following zones: a greening zone, an industrial complex zone, a residential development zone, and a transportation zone. Plant material is selected in each zone. The analysis of plant vitality indicators for bioindicative purposes is best carried out at the end of the growing season – in