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Improving environmental competitiveness of air transport enterprise

Grounded the ways that can be used to reduce the negative impact of air transport enterprise on the environment. Determined the concept of environmental competitiveness of airline company.

Among the conditions required for competitiveness of air transport enterprise, an important place is occupied by environmental safety, which concerns not only the use of aviation services, but also directly the existence of actual and potential customers. The processes that take place during passenger and cargo air transportation contribute to the negative environmental impact. The main directions of such impact are: the air pollution both at the territory of air transport enterprise, and around it; the soil and body of water pollution by waste water from the territory of air transport enterprise; significant acoustical load on the environment (aircraft noise); powerful electromagnetic radiation from facilities of air transport enterprise.

Environmental insecurity of airline companies does not promote the growth of their competitiveness, especially in international air transportation. Improving environmental competitiveness of airline companies based on the modernization of aircraft engines is impossible due to lack of funds, but airline companies may carry out partial replacement of land special purpose vehicles.

Environmental competitiveness of air transport enterprise is characterized by the ability to provide ecological safety of aviation services to existing and potential consumers. To understand the environmental hazard of airline company we determine emission sources and propagation paths of atmospheric pollution. This makes it possible to direct our efforts to reduce them. There may be several ways to reduce atmospheric pollution. For example, to make changes in existing processes, to replace equipment with environmentally perfect one, to improve conditions of fuel combustion in engines and other engineering measures. Sometimes only organizational measures are required, such as reducing the number of simultaneously run engines. And sometimes, on the contrary, solving the problems of air pollution requires a comprehensive approach. The real mean provided to reduce pollution is specifying Maximum Permissible Emissions (MPE) of air pollutants for each unit (engine, vehicle, equipment, etc.) per year. Processing units that do not meet these requirements are prohibited to use.

Air transport enterprise has a small amount of solid emissions that are harmful to humans and biological objects. Therefore, they are recycled as secondary raw materials or exported to municipal landfills. If these wastes are toxic, then they before removal are to be mandatory neutralized or detoxificated. Emissions and discharges of pollutants, waste disposal in the environment lead to degradation of lands, waters, minerals, flora and fauna, as well as to reduction of human health indications. As a result, it leads to damage. According to the Law of Ukraine "On

Environmental Protection", one such mean of environmental protection is charging for pollution of environment and deterioration of natural resources, as well as compensation for the damage caused by violation of applicable laws.

Environmental risk of airline company is characterized by complex damage that is the consequence of aviation activities. Thus, only for air pollution, experts distinguish between economic, socio-economic, social and environmental damage.

The economic damage that can be calculated in monetary form includes:

– damage for the funds required to eliminate the consequences of pollution in industry and residential sector;

– damage due to reduced output of industrial and agricultural production;

– damage due to reduced productivity of natural biogeocenoses;

– damage arisen because of the emissions into the air include the part of materials and natural resources;

– costs required to support or adjust the necessary balance in natural ecosystems;

– costs caused by reduced lifetime of buildings and structures;

– damage arisen by decreased productivity as a result of increased population morbidity rate.

Computable socio-economic damage includes:

– costs for social security of population, which growth of morbidity rate is associated with environment pollution;

– constantly rising costs for preservation of natural recreational resources;

– additional costs required to provide the proper rest for population;

– damage that is increased as a result of environmental human migration.

The social damage that is almost incomputable includes:

– aesthetic damage from partial or full degradation of environmental landscapes;

– psychological damage that accumulates as a result of people dissatisfaction with the quality of environment.

The environmental damage, which is also almost incomputable due to required huge amount of relevant information, knowledge and time, includes:

– disappearance of flora and fauna species;

– destruction of unique environmental ecosystems that are accumulated as a result of genetic errors specific to new, younger generation of people.

Thus, environment pollution from non-stationary sources arising as a result of air transport enterprise activity creates the economic, socio-economic, social and environmental damage. Damage compensation is made in regulatory manner by applying the environmental tax.

To calculate pollutant emissions into the atmosphere from ground-based aircraft equipment the following formula is used:

$$M^{\tau}_{j} = \sum_{s=1}^{n} (K_{1j}\ K_{2j}\ K_{3j}\ K_{4j} K_{5j} m_j L_s)\, 10^{-3} \quad (1)$$

where: M^{τ}_{j} - total emission of j-th harmful component (CO, C_xH_y, $NO_{x)}$ by

i-th vehicle per time τ, kg/year;

n - the number of i-th vehicles at aviation enterprise;

m_j - the kilometrage of j-th vehicle per year;

L_i - actual (or reduced) kilometrage of i-th vehicle per year, km/year;

K_{1j} - impact factor of vehicle age on emission of j-th pollutant;

K_{2j} - impact factor of annual average temperature;

K_{3j} - impact factor of average atmospheric pressure;

K_{4j} - impact factor of average humidity;

K_{5j} - impact factor of vehicle technical condition.

Important factors that contribute to an increase of emissions from non-stationary sources is the age and technical condition of fixed assets (vehicles). Thus, minimizing of pollutant emissions is only possible through full modernization of engines and upgrading ground-based equipment of air transport enterprises.

Pollution of environment from non-stationary sources produced as a result of air transport enterprise activity leads to economic, socio-economic, social and environmental damage. Ability of airline company to prevent this damage shows its environmental competitiveness. Environmental creditworthiness is determined by calculating the value of reduced emissions of pollutants by the results of upgrading ground-based equipment at the expense of airline company.

References

1. Franchuk G., Malakhiv A. Ecological environmental problems.- Kyiv: KMCA, 2000. – 180p.

2. Drachuk U. Efficiency of innovation and safety of production – Donetsk: NAN Ukraine, 2011. – 272p.

3. Ways of improvement of ecological and economic activity of enterprises: Monograph./ Grebenkin S., Kostenko V., Astapova G. – Donetsk: VIK, 2009. – 223p.