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THIRD PARTY RISK AROUND AIRPORTS AS AN ENVIRONMENTAL ISSUE

Boris Blyukher [1] (SSL (E) – E), Oleksandr Zaporozhets [2]

[1] Indiana State University, Terre Haute, USA

[2] National Aviation University, Kiev, Ukiraine

Анотація. Аеропорти цивільної авіації чинять антропогенний вплив на навколишнє середовище за рахунок одночасної присутності небезпечних чинників різної ґенези і несприятливого позиціонування їх джерел. Серед домінуючих чинників екологічного ризику, характерних для аеропортів, є дорожньо-транспортні пригоди, зокрема авіаційні події та інциденти, які класифікуються використанням ризику третьою сторони.
Ключові слова: екологічна безпека, аеропорти, ризик третьої сторони.

Аннотация. Аэропорты гражданской авиации оказывают антропогенное воздействие на окружающую среду за счет одновременного присутствия опасных факторов различной генезиса и неблагоприятного позиционирования их источников. Среди доминирующих факторов экологического риска, характерных для аэропортов, являются дорожно-транспортные происшествия, в частности авиационные события и инциденты, которые классифицируются использованием риска третьей стороны.
Ключевые слова: экологическая безопасность, аэропорты, риск третьей стороны.

Annotation. Civil aviation airports create anthropogenic pressure on environment due to the simultaneous presence of hazardous constituents of different genesis and the unfavorable positioning of their sources. The dominant environmental hazards specific to airports are traffic accidents, notably aircraft accidents and incidentsб which are classified via third party risk.
Keywords: Environmental safety, airports, third party risk.

Environmental safety is a state of the environment which ensures the prevention of degradation (risks to ecosystems' health) and mitigates risks to human health. Environmental safety is a component of the national safety and security, providing protection for the vital interests of individuals, society, the environment and the state from real or potential threats posed by man-made or natural factors in the environment. At current stage of human development, the main real and potential threats to the national security of any country in the environmental domain are significant anthropogenic disturbances and technological (man-made) overloads, and increased risks of anthropogenic and natural disasters.

Aviation industry - one of the most striking examples of the existing dangers for human life, their sources and factors, in most cases – of a complex character. As an example - in the

classification of environmental problems of air transport processes the ICAO considers disasters and accidents, which are usually the factors of flight safety, but at the same time they are the sources of environmental hazards around the airports, i.e. manmade (technogenic) hazards, as a consequence, may generate the sources of danger to the environment. With air traffic projected to double in the next 15 years, current and emerging safety risks must be addressed proactively to ensure that this significant capacity expansion is carefully managed and supported through strategic regulatory and infrastructure developments. In all of its coordinated safety activities, ICAO strives to achieve a balance between assessed risk and the requirements of practical, achievable and effective risk mitigation strategies.

In the air transportation system air traffic is centered on airports. For the population living in the vicinity of airports, this implies involuntary exposure to a number of impacts, including the risk of aircraft accidents. Current inventory of environmental problems in the aviation sector groups the issues into seven categories: aircraft noise, air pollution near airports, global phenomena (global warming and climate change), airport/infrastructure construction (landscape-transforming factor), water/soil pollution near airports, airport waste management, and aircraft accidents/incidents. Continuous safety enhancements have a direct and positive impact on the overall efficiency and environmental performance of the global air transport system.

Environmental safety is considered as a dynamic component of the regional system, which ensures harmonious development of protection from real and potential anthropogenic impacts and threats. Managing environmental safety effectively is possible only based on the study of the conditions of formation and manifestations of environmental threats and hazards, and analysis of specific threats and hazards to identify regionally significant components of danger and their sources. Environmental risk has in general a complex hierarchical structure (Figure 1) [1]. Technogenic (technological or man-made) safety, linked to human impact on the environment, is a part of environmental safety. The technogenic component of environmental threats and hazards describes the impact of technological facilities and activities on people and the environment (landscape, fauna and flora, etc.). One of the anthropogenic impacts with its specific types of threats and hazards is concentrated around airports.

Civil aviation airports create anthropogenic pressure on environment due to the simultaneous presence of hazardous constituents of different genesis and the unfavorable positioning of their sources. Placement and functioning of different stationary objects (mechanical and galvanic stations, storages for fuels and lubricants, painting stations and

pumps for petroleum products transportation, boiler installations), vehicles, etc. in the powerful commercial aviation systems cause the convergence in time and place of a significant number of hazardous factors (threats), and significantly enhance their negative impact on the population around airports. The dominant environmental hazards specific to airports are traffic accidents, notably aircraft accidents and incidents.

In [1] a hierarchical structure of man-made hazards is proposes, highlighting threats generated by operating factors, with a limited number of their subtypes. Based on investigations, this hierarchical system of threats and hazards was extended under normal and abnormal operational conditions of **ergatic systems** or man–machine systems. The class of anthropogenic environmental safety consists of threats and hazards produced by the following factors: chemical, physical, biological, landscape-transforming, information, innovative design or operational. In particular, the operational factors are defined by malfunctions in technologies, systems and designs, insufficient human performances and their errors, and malfunction in information systems which allow the management and control of the overall ergatic systems and conditions of the outer environment, inside of which the ergatic systems are operating. Among these man-made environmental threats and hazards, there are specific factors associated for instance with the uncontrolled exploitation of lands near the highways, railways and airports for industrial and residential construction.

Abnormal conditions can lead to accidents, such as traffic or more particularly aircraft accidents, with the following impacts on the environment: risk to third parties (impairments of the health of the population and even fatal consequences for people living around airports); risk to wildlife, especially for birds (with reverse impact on safety in case of collision with aircraft); and risk associated with infrastructures surrounding the airport areas (storages of hazardous substances, pipelines, other critical objects, etc.). In such cases, both environmental and flight safety hazards lead to the genesis of risk factors. Only a balanced approach, similar to aircraft noise control formulated by ICAO], may be used to manage such a complex system efficiently. The basis for the balanced approach in environmental protection consists of the implementation of measures to reduce the adverse effects of aircraft on the environment during their operation; zoning, planning and control of land use around airports; monitoring the levels of exposure to adverse factors inside airport area and in the vicinity of the airports; and implementation of economic regulations to environmental protection, and so on.

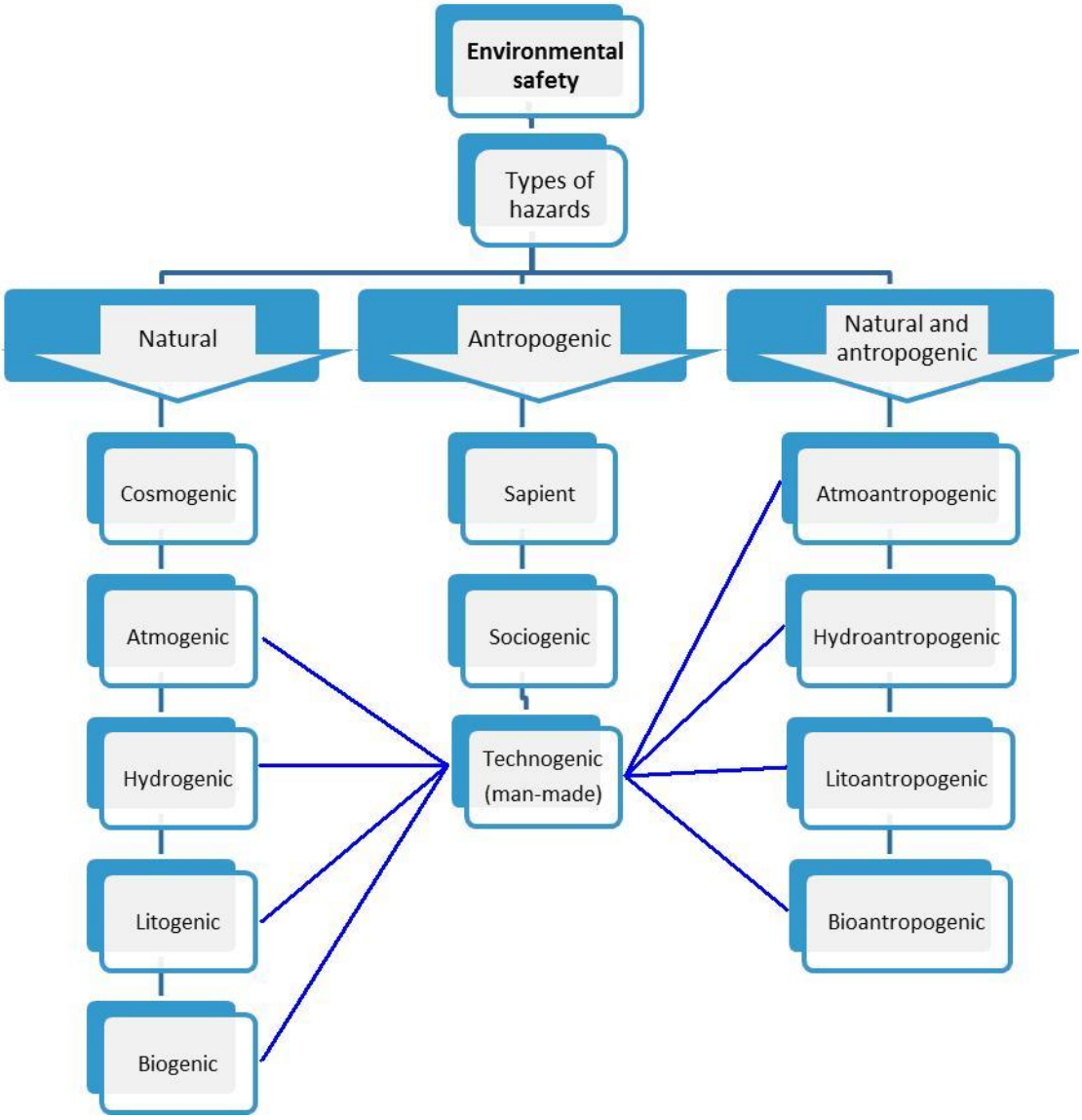

Figure 1 – General hierarchical structure of environmental safety, hazards and risks

Until recently, risks to health and life were defined largely from the purely scientific perspective, even though it has been recognized for some time that risks are commonly understood and interpreted very differently by different groups in a society, such as scientists, professionals, managers, the general public and politicians. Assessment and management of risks to human health and life is a relatively new area of study that has been expanding steadily since the early 1970s]. It began by the development of scientific methods for identifying and describing threats/hazards and for assessing the probability of associated adverse outcomes and their consequences. Particular attention has been given to the type and scale of the adverse consequences, including mortality. Early studies on risk were mainly developed in the US and Europe.

During the early 1980s, risk analysis evolved into the two main phases of risk assessment and risk management, as more attention was given to how hazards or risk factors could be controlled both at the individual level (**individual risk**) and by society (**societal risk**) as a whole. The emphasis moved from determining the probability of adverse events for different risk factors to assessing the scale and range of possible consequences, and at the same time reducing any uncertainties in the estimates. Mortality is commonly seen as one of the most important consequences. Many risks were characterized as behavioural in origin and largely under individual control, which gave rise to the lifestyle approach in health promotion.

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Risk assessment can be defined as a systematic approach to estimate the burden of disease and/or injury resulting from different hazards . The first estimates of disease and injury burden attributable to a set of hazards were reported in the global burden of disease study. All the defined risk factors that were assessed were either exposures to the environment (for example, unsafe water), human behaviour (for example, tobacco smoking) or physiological states (for example, hypertension). There was a lack of comparability between different risk factor assessments due to different degrees of reliability in assessing the risk factors and lack of standard comparison between the groups.

World Health Organization (WHO) considers that transportation (road, aircraft, rail, etc.) and traffic-related injuries are a major but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention. Worldwide, the number of people killed in transportation (mainly road traffic) crashes each year is estimated at over 1 million, while the number injured could be as high as 50 million. Traffic accidents are estimated to be the eighth leading cause of death globally, with an impact similar to that caused by many communicable diseases, such as malaria [1]. Forecasts for 2020 predict that this hazard will be the 3rd in rank order of disability-adjusted life years (DALYs) for the 10 leading causes of the global burden of disease. At the national level, transportation-related injuries result in considerable financial costs, particularly in developing economies. Indeed,

transportation traffic injuries are estimated to cost low- and middle-income countries between 1–2 % of their gross national product, estimated at over US$ 100 billion a year [2].

It is important to note that ICAO and ACARE targets and goals are not only to reduce noise levels and air pollution concentrations: *the novelty of the approach is the idea that noise and air pollution reduction at receiver point are not the final objective for the society, but a tool to achieve the real final goal which is the reduction of the noise and air pollution effects.* This effect is defined currently by ICAO as *a reduction of the number of people affected by aircraft noise and air pollution* [113]. The same approach is needed when analysing the effects of aircraft accident risk—the aim is to reduce the number of people affected by this risk, while there can also be damage to material assets and ecological systems [13].

Third party risk is in many ways similar to local air quality and noise issues in that it impacts mainly the population living close to airports: this population gains certain economic, employment or other benefits from air traffic but is also subject to its negative effects. Noise and third party issues also carry similar implications in terms of zoning and land use planning: different levels of protection zones with respect to noise and risk exposure can be established around airports, restricting land use and further developments. Third party risk is therefore not merely a safety issue, although the accident rates (based either on historical data or modelling and simulations) used in risk calculations are naturally related to aviation safety. Environmental problems might arise from aircraft accidents while incidents involving dangerous goods carried as cargo are likely to occur only under exceptional circumstances. The quantities of dangerous goods carried on aircraft are so small that they only pose environmental hazards of a very localized nature. In the event of accidents, fuel spills could be of environmental concern but a fire is a much greater risk. Action taken to improve aviation safety helps to reduce the likelihood of these problems.

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БЕЗПЕКА ПРАЦІ ПРИ МОНТАЖІ ТА ЕКСПЛУАТАЦІЇ КЛІМАТИЧНОЇ ТЕХНІКИ

SAFETY DURING INSTALLATION AND OPERATION OF HVAC EQUIPMENT

Студент В.С. Волошин, керівник О.С. Скрипник

Харківський національний університет міського господарства імені О.М. Бекетова

Анотація. Розглянуто причини виникнення травматизму під час виконання монтажних робіт та експлуатації кліматичної техніки.
Ключові слова: кліматична техніка, безпека праці

Аннотация. Рассмотрены причины возникновения травматизма при выполнении монтажных работ и эксплуатации климатической техники.
Ключевые слова: климатическая техника, безопасность труда

Annotation. Reasons occurrence of injuries during the installation and operation of HVAC equipment.
Keywords: HVAC equipment, safety