Safety engineering of anthropogenic facilities in applied sciences

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Abstract

Statement of the Problem:

The development of civilisation brings with it many threats and, consequently, a loss of security in the broadest sense. Help in eliminating threats may be provided by applied sciences, which gather knowledge allowing to solve specific real-life problems and to use the achievements of the developing safety engineering, which grew out of the problems connected with the necessity of counteracting the threat to mankind and the whole natural environment as well as the goods of civilisation by catastrophes of technical objects from all areas of technology (construction, industry, transport, mining, armaments industry, etc.), natural phenomena (earthquakes, hurricanes, avalanches, floods, etc.) and deliberate acts of God.), natural phenomena (earthquakes, hurricanes, avalanches, floods, etc.) and deliberate destructive actions and lack of knowledge of the risks caused by anthropogenic objects.

Safety engineering of anthropogenic sites in applied science requires: interdisciplinary, general technical and specialised knowledge of the basic methods and tools used in solving engineering tasks related to the broadly understood safety of anthropogenic facilities - in the processes of their design, manufacture, operation and decommissioning; knowledge of modern technologies and research tools for detecting and forecasting the development of threats, ICT information processing, protection and prevention of threats and elimination of their consequences throughout the life cycle of an anthropogenic site; the ability to diagnose the hazard status of anthropogenic sites using modern technologies and research tools; knowledge of the principles of safety engineering adopted in European and national legislation

Conclusion & Significance:

The theoretical considerations security in the life of an anthropogenic object, it is reasonable to consider security in two areas: subjective and objective - depending on w here the threats are located [11]. This is due to the functioning of each anthropogenic object in a specific environment, which is conventional for each object, and to the fact that each anthropogenic object can cause different (subjective) risks for each person.

Depending on who/what they affect, where they are located and where the threats originate from, a distinction can be made:

Entity security: external, internal, which means the absence of threat from the entity using the anthropogenic object (internal) or the absence of threat from other entities in the environment (external); subject safety: external, internal, means the absence of danger to other objects from the anthropogenic object (internal) or the absence of danger to the anthropogenic object from other surrounding objects (external).

Image

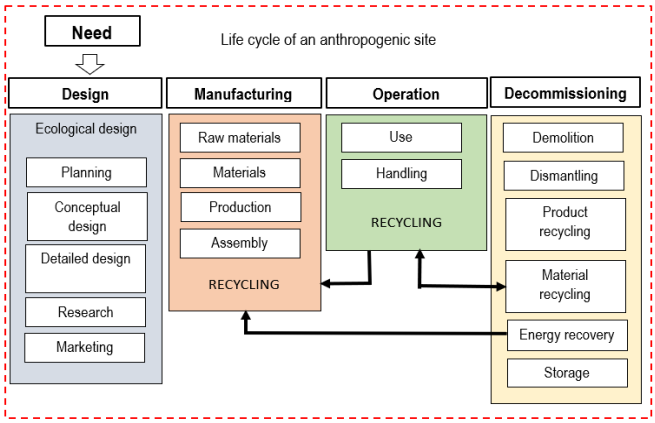

Fig.1. Life cycle of an anthropogenic site

By combining the internal and external aspects of safety, one obtains a holistic view of the safety of an anthropogenic object in the systemic view of engineering, which includes activities that make it possible to satisfy the various human needs concerning the technical, economic, legal and organisational approaches occurring in the processes of designing, constructing and operating objects aimed at ensuring their safety by eliminating/reducing the hazard to an acceptable level or creating conditions that ensure effective protection against them .

Recent Publications

1. Obolewicz, J.; Baryłka, A.; Szota, M. Culture on construction objects, Journal of Achievements in Materials and Manufacturing Engineering, 116 (2), 2023.
2. Obolewicz, J.; Baryłka, A.; Szota, M., Safe operation of buildings during the winter period, Journal of Achievements in Materials and Manufacturing Engineering, 116 (1), 2023.
3. Borkowski S.; Kaczmarska B; Szota M.; Baryłka A., Leadership principles (4E-1P) as a basis for evaluation of a manager in the context of their behaviour during manufacturing automotive parts, Journal of Achievements in Materials and Manufacturing Engineering, 121 (2), 2023.
4. Szota M. , Rychlik A, Milewski L., Dobrzańska-Danikiewicz A. D., Implications of loss of stability of deformation sequences of reinforced concrete sections, Journal of Achievements in Materials and Manufacturing Engineering 121 (1), 2023.
5. Obolewicz, J.; Baryłka, A.; Szota, M, Safety engineering of anthropogenic facilities in applied sciences, Inżynieria Bezpieczeństwa Obiektów Antropogenicznych, 3 (2023).

Photograph

Biography

Professor Michał Szota is a graduate of the Faculty of Electrical Engineering of the Czestochowa University of Technology (CUT)- in 1996 he graduated in electrical engineering. In 2003, he started doctoral studies at the Faculty of Process Engineering, Materials and Applied Physics of CUT; in May 2008 he obtained a PhD in technical sciences. He obtained his habilitation in 2012 at the Faculty of Mechanical Engineering of the Lodz University of Technology. He is the author and co-author of numerous scientific publications on surface engineering, biomaterials, heat treatment technologies, the use of neural networks to model heat treatment processes and the production of functional amorphous and nanocrystalline alloys. He has been professionally associated with the Czestochowa University of Technology for many years. He was, among others, vice-dean of the Faculty of Production Engineering and Materials Technology, director of the Technology Transfer Centre, rector's representative for intellectual property there. Since 2022, he has been employed as a professor at the Fire Academy. He is the president of the Association of Polish Inventors and Rationalizers, the president of the European Association of Inventors and the vice-president of the International Federation of Inventors' Associations.

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