UDC 111.852
DOI: https://doi.org/10.21564/2663-5704.61.304639

Ushno Iryna Mykhaylivna, Candidate of Philosophical Sciences,
Associate Professor of the Department of Philosophy and Social Sciences,
National Aerospace University «Kharkiv Aviation Institute» (KhAI),
Kharkiv, Ukraine
e-mail: i.ushno@khai.edu,
ORCID ID: 0000-0003-3660-3666

AESTHETICS IN THE «MAN-MACHINE-ENVIRONMENT» SYSTEM: THE SEARCH FOR HARMONY

The modern «human-technology-environment» (MMESE) system encompasses a wide range of interconnected issues. This system can be approached from various perspectives, including safety, efficiency, globalization, and more. The aim of this article is to explore the aesthetic dimension of MMESE in the aerospace context. In a broad sense, aesthetics serves as a space for realizing the «human-technology-environment» system. In practical terms, aesthetics serves as an indicator of the harmonious interaction of all components of this system. The aesthetic component acts as a catalyst for change, facilitating the implementation of improvements and new solutions in the professional environment. Within the «human-technology-environment» system, technical aesthetics enables the addressing of issues related to satisfaction, inspiration, as well as the ergonomics and comfort of aerospace engineering.

Keywords: *technical aesthetics, aerospace engineering, human, technology, environment, values.*

Problem statement. With the conquest of technology, our modern world is characterised by unparalleled development and transformation. Technology affects every aspect of our lives, including our relationships, experiences and perception of the environment. In this context, aesthetics, as the study of beauty and its perception, takes on a new dimension as it becomes a key element in the interaction between man, machine and the environment.

Technical aesthetics improves our perception of technology and helps us to create not only functional and sustainable but also beautiful technical solutions. It requires a balance between form and function, and considers technology as a possible source of inspiration for art and design. By looking for beauty in technology, we develop new ideas that help improve the quality of life for people and the environment. Technical aesthetics reminds us that beauty can be found

everywhere, and understanding it is important for the development of modern society. As an example, the article discusses the field of aerospace engineering, where technical skill and art are combined to create modern machines that not only operate in the sky but also fascinate us with their aesthetics. The technical aesthetics of aerospace engineering has become one of the most important aspects of the industry's development, giving flights not only functionality but also a distinct aesthetic value. Despite its wide practical relevance, this topic is not sufficiently represented in modern Ukrainian scientific thought, especially in the «man-machine-environment» system.

Analysis of recent research and publications. From the outset, it should be emphasised that the term «man-machine-environment system» is mentioned in the document DSTU 3899–99: design and ergonomics, but it is borrowed from the English-language literature. The study of such a system began in the second half of the 20th century, and recent scientific conferences on this topic are held all over the world, and the following can be cited as a classic definition: «MMESE primarily focuses on the relationship between Man, Machine and Environment, studying the optimum combination of man-machine-environment systems. In this system, «Man» refers to working people as the subject in the workplace (e.g. operators, decision-makers); «Machine» is the general name for any object controlled by Man (including tools, machinery, computers, systems and technologies), and «Environment» describes the specific working conditions under which Man and Machine interact (e.g. temperature, noise, vibration, hazardous gases etc.). The three goals of optimization are to ensure «Safety, High efficiency and Economy» of man-machine-environment systems»[5]. But nowadays, this system is increasingly being considered as part of ergonomics research. «The study of safety, reliability and amenity in industrial design is to analyze the factors in the «man-machine-environment» system by means of ergonomics so as to provide reliable design parameters and test data for product design»[16]. The connection between ergonomics and technical aesthetics is noted by Ukrainian authors: Hnatiuk L., Osadcha K. [3], Oksentiuk B. [7] and others. Thus, ergonomics becomes the main link between MMESE and technical aesthetics. Technical aesthetics can find solutions to many problems of MMESE. For example, L. A. Sydorchuk notes the main problems of MMESE:

– insufficient efficiency of the MMESE;
– the phenomenon of increasing workplace injuries;
– personnel problems;
– an increase in the number of neuropsychiatric diseases caused by «industrial stress»[13].

In the article, we will try to show how aesthetics can become a factor in harmonising relations in «man-machine-environment» system and, using the

example of aerospace engineering, emphasise the impact of technical aesthetics on solving such problems.

Formulation of goals. Based on the above materials, the purpose of the article is to study the aesthetic dimension of the «man-machine-environment» system as a harmonious component on the example of aerospace engineering. To achieve this goal, we will try to consider the following issues:

– Man and his aesthetic preferences;
– Machine (Technology) as an expression of aesthetics;
– Environment as the basis of aesthetic perception;
– The search for harmony in the «man-machine-environment» system.

For a more realistic view, we will turn to the practice of aerospace engineering as a modern field of application of technical aesthetics.

Presentation of the main material. A person, as a subject of perception, has his or her own preferences for aesthetics, which are formed under the influence of various factors, including cultural, social and personal aspects. A deeper understanding of these preferences allows us to better understand how people perceive technology and the environment around them.

Cultural factors have a huge impact on people's aesthetic preferences. Tastes and perceptions of beauty are shaped by cultural norms, traditions, artistic movements, and historical influences. For example, in some cultures, colours and patterns may have specific meanings that influence aesthetic perception.

The social environment also influences a person's aesthetic preferences. Fashion trends, beauty standards and social norms shape our perception of beauty and aesthetics. For example, in today's world, some aesthetic standards can be defined by the media and social media.

Personal preferences are the result of individual experience, upbringing and personal tastes. People may prefer certain styles, shapes, colours or materials based on their own experiences and inner harmony. For example, a person who grew up in a family with a strong artistic influence may have a greater interest in aesthetics and look for beauty in the environment.

A person's aesthetic preferences often reflect their desire for harmony and balance. Many people seek a sense of beauty and tranquillity in their environment, and their aesthetic preferences may reflect this desire. For example, a person may prefer natural elements in design or simplicity and minimalism in architecture.

Human aesthetic preferences are a complex, interactive mechanism that takes into account cultural, social and personal factors. Understanding these preferences allows us to better understand how people perceive technology and the environment. This is important for the development of products and environments that meet the needs and expectations of different people, promoting harmony and balance between people, technology and the environment.

Modern technology not only provides functionality, but also has a powerful aesthetic potential. From smartphone design to architectural structures, technology is becoming an expression of our perception of beauty. In addition, it affects our sense of comfort, perception of time and space, thereby shaping our aesthetic attitude to the world around us. In addition to its functionality, modern technology has a huge potential to express aesthetics in all its aspects. Design, shape, materials and colour are all components that influence the perception of technology and make it aesthetically pleasing to the consumer. This topic was covered in more detail in my article [15].

First of all, the design of technology is not just a look, but also a reflection of the idea and concept behind the product. Whether it is minimalist and modern, or complex and ornamental, each style has its own fans. For example, Apple is known for its minimalist design, which conveys a sense of elegance and simplicity.

Secondly, the shape is also important. It can be ergonomic and easy to use, or it can give the impression of playfulness and experimentation. For example, the expanded screens of smartphones and laptops can be a reflection of the contemporary art of form and function.

Thirdly, the materials used to make the equipment also have a significant impact on its aesthetic appearance. They can be matte or shiny, textured or smooth, natural or artificial. For example, the use of glass in a design can create a sense of lightness and transparency, while metal can add sophistication and stability.

Fourth, colour plays an important role in the perception of technology. It can convey mood, style or brand identity. Bright and saturated colours can attract attention and evoke emotion, while muted and natural shades can convey a sense of calm and harmony.

In line with the emphasis on the importance of form and design, it is necessary to reveal the background of scientific thought, namely the concept of «affordance». This term was coined by J. J. Gibson [2], from the word «afford», and defines a property or feature of an object that gives a hint or clue as to what can be done with this object – technological potential. A property of an object that suggests what can be done with it. Engineers and designers are always interested in this phenomenon. For example, the use of technological capabilities is the use of a river current that can be used to float trees, or the property of a tree that does not sink in water can be useful for transporting things. In today's technological world, the concept of affordance allows us to create additional functions. It is the design that helps the user understand how to use these technologies in the best way. Design becomes a good assistant, gently suggesting what to press and what to turn or pull upwards. This is how form and design work together: first, the form suggests additional potential possibilities, and the design becomes more ergonomic and helps us to master more and more complex technological devices.

The main problem is the emergence of a stable association, when it becomes difficult for us to see new ways of using the form. Ergonomic design accustoms us to convenience and aesthetics to such an extent that we cannot even imagine new possibilities. In this case, materials and colour come to the rescue, but innovation becomes the main feature.

Innovation can also be a means of aesthetic expression. New technologies, such as flexible screens or frameless displays, can create an impression of magic and modernity. They reflect not only technical progress but also aesthetic sophistication.

Technology as an expression of aesthetics is a complex and multifaceted concept that combines design, form, materials, colour and innovation. Each of these elements together creates the impression of a product and influences our aesthetic perception. Through the combination of these factors, technology can become not only a functional tool, but also a work of art that inspires, delights and brings aesthetic pleasure.

The environment acts as a platform for aesthetic perception. It combines both natural and artificial objects that interact with technology and humans. From the location of buildings to landscape design, the environment influences our aesthetic pleasure and sense of well-being.

Landscape design plays an important role in creating an aesthetic environment. It combines natural elements, such as plants, water and topography, with architectural features and infrastructure to create a harmonious composition. Properly planned green spaces, squares and parks can become a place of relaxation and enjoyment for residents and visitors alike.

Architectural objects influence the aesthetic perception of the environment through their design, shape and materials. They can create an impression of monumentality, elegance or innovation. In addition, architectural structures can be integrated into natural landscapes in a way that maintains harmony with nature and the environment.

Technology can be used to enhance the aesthetic experience of the environment. For example, lighting and audiovisual effects can create atmosphere and mood in public spaces. It is also important to consider the environmental impact of technology and ensure that it complies with aesthetic standards.

Conservation of natural resources and biodiversity is important for creating an aesthetically pleasing environment. Natural landscapes, water sources and ecosystems are of great value not only for aesthetic pleasure, but also for the health and well-being of the population.

The environment around us has a huge impact on our aesthetic perception and overall comfort. The combination of natural and man-made objects in a harmonious composition allows us to enjoy the beauty and tranquillity of the world around us. It is important to develop and preserve this aesthetic wealth for future generations,

creating space for the favourable development of humans and their socio-cultural environment.

The main task of modern society is to find harmony between people, technology and the environment. This means understanding and taking into account aesthetic needs in each of these areas. It is important to strive to create technologies that are not only functional, but also aesthetically pleasing and harmoniously integrated into the surrounding landscape. It is also important to develop a conscious perception of beauty and conserve natural resources to ensure that the aesthetic integrity of the environment is maintained.

Harmony between Man and Technology means that technology meets the needs and requirements of humans, providing convenience, efficiency and aesthetic pleasure. This means developing interfaces and designs that facilitate comfortable and enjoyable use of technology.

Harmony between Man and the Environment means that people are part of the natural environment, preserving its aesthetics and richness, avoiding unnecessary interference and pollution. This means the development of urban spaces that reflect a balance between buildings and green spaces, as well as the rational use of resources.

Harmony between Technology and the Environment involves developing technologies that ensure sustainability and efficiency without harming nature and the environment. This may mean using renewable energy sources, rational use of materials and technologies to reduce emissions and environmental impact.

A key aspect of the search for harmony in the «man-machine-environment» system is the pursuit of aesthetic harmony. This includes understanding and encouraging the development of technologies and designs that are not only functional, but also aesthetically pleasing and harmoniously integrated into the environment.

The search for harmony in the «man-machine-environment» system is a complex and multifaceted task that involves taking into account the needs, values and aesthetic preferences of all parties to the interaction. Only by ensuring a balance between humans, technology and the environment can true harmony be achieved and a space where everyone can enjoy beauty, comfort and sustainability be created.

Aerospace engineering is the best fit for our requirements – to show technical aesthetics as the main factor in minimising MMESE problems. Using the aerospace industry as an example, we will consider the issues of improving the efficiency of the MMESE, the work of personnel and consumers, as well as the problem of overcoming «industrial stress».

The history of aviation dates back to brothers Wilbur and Orville Wright and other industry pioneers who dreamed of conquering the skies. Despite its young age, aviation's technical achievements have evolved rapidly, changing the way aircraft look. But beyond functionality, design and aesthetics played an important

role in the development of aviation. Aircraft, such as planes and helicopters, are works of engineering where every element has a function and must be optimised to achieve the best possible performance. However, this functionality does not prevent them from being expressive masterpieces of technical aesthetics.

On the contrary, the aviation industry is becoming one of the leading areas where technical aesthetics is developing at a breakneck speed. There were reasons for this rapid development, due to the nature and specifics of the aviation industry. To understand the main directions of development of technical aesthetics in aviation, it is necessary to emphasise key points.

Firstly, an important aspect of technical aesthetics in aviation is aerodynamic design, which helps aircraft become more efficient and sustainable. Every wing curve, every corrugated skin, every fuselage shape is subjected to careful calculation and research. At the same time, designers try not only to optimise performance, but also to create beauty in the shapes of aircraft. This can be seen in the graceful lines of modern aircraft, which remind us of birds flying smoothly in the sky. Such associations only add to the aesthetic pleasure of watching an aircraft in the sky. The impression of the beauty and technical perfection of an aircraft is becoming a popular subject for art: literature, film, painting.

Secondly, in addition to aerodynamic design, technical aesthetics are manifested in the details of aircraft, such as cockpits, passenger compartments and exterior colour schemes. All of these aspects are important in creating impressive and functional aircraft. Technical aesthetics in aviation extends to the interior design of aircraft. Aviation designers are developing modern cockpits where ergonomics and innovative solutions are combined with the practice of creating a comfortable working environment for pilots. Passenger cabins are becoming real «flying hotels» with comfortable seats, entertainment systems and exquisite décor. They create an atmosphere of comfort and luxury, even on long-haul flights. Over time, travelling by plane has become a daily routine for many people. Constant use, spending a lot of time in the sky, makes designers improve this aesthetic.

Thirdly, aesthetics is important in corporate aviation design. For example, corporate colours, airline logos, and additional elements of aircraft according to the brand book are subject to careful analysis. Much attention is paid to the development of staff clothing design. Modern designers are invited to participate in order not only to create comfortable outfits but also to add aesthetic value to them, to create an impression of elitism and chic. The visual image of a steward or flight attendant evokes aesthetic pleasure. Until now, many airlines have strict requirements for the appearance of their staff.

Fourthly, technical aesthetics in aviation is not limited to aeroplanes and helicopters. It also appears in the design of airports and terminals. Modern airports remain true architectural masterpieces that combine functionality and aesthetics.

They impress with their grandeur, modern materials, light installations and art objects that make the space more comfortable and exciting. All additional services on the ground also carry this message. Technical aesthetics is present in ground transport and technical support services, especially if the work of these services can be observed by passengers.

Aerospace aesthetics is not limited to aircraft and airports. It also includes visual materials, pictures and videos from above. Such footage from space can be perceived as symbols of beauty and aesthetics. The «view from the sky» becomes an extraordinary aesthetic experience for a person when he or she is in an aeroplane or rocket. Being in the sky makes the feeling of being in the «man-machine-environment» system as real as possible. This aesthetics gives no chance to doubt that people are part of this system.

The technical aesthetics of aviation is a complex work at different levels of visual perception. The romanticisation of air travel has always contributed to the creation of a special atmosphere in this unique space. The meaningful message of the visual concept in aviation was formed under the influence of the modern and then postmodern societies. The theory and practice of the consumer society contributed to a more thorough approach to the implementation of the «sky-plane-girl» idea. This idea was supposed to sell a dream: a person's timeless desire to reach for the stars. That is why aviation, along with the car industry, is becoming the most technically aesthetic field. Beauty, dream, romance, spiritual aspiration for the beautiful, pure, heavenly – the list of such associations can be continued and should be explored in more depth.

It is impossible to avoid the issue of the Ukrainian tradition in aerospace aesthetics. The chief designer Oleg Antonov was well aware of the nature of the relationship between technical excellence and beauty. O. Antonov was a creative man who combined many talents. It was his authority that became the basis for the modern aviation industry in Ukraine. Design and engineering activities in the Ukrainian tradition are the foundation of the visual image in the domestic aviation industry. «Mriya» as a unique aircraft, «Mriya» as a symbol, «Mriya» as an art object. In Ukraine, art and aviation came together to participate in the Venice Biennale in 2019 as part of the project Falling Shadow, Mriya to the Giardini Gardens. The flight was supposed to take place, but unfortunately it did not. It was the most ambitious cultural project in Ukraine. The fact that such an idea came to life demonstrates the great aesthetic and socio-cultural value of aviation in our society.

Technical aesthetics in aviation is proof that beauty can exist alongside functionality. It provides aviation with not only efficiency and safety, but also expressiveness and sophistication, creating aircraft and infrastructure that delight us and inspire us to new heights. Technical aesthetics in aviation impresses us with

its harmony, grace and demonstrates the high level of craftsmanship achieved in this industry. Ukrainian aviation is an excellent example of how technical aesthetics can influence both the industry and the cultural consciousness of society as a whole.

Conclusions. Aesthetics in the «man-machine-environment» system is becoming a key factor in the formation of harmonious relationships between humans, technology and the environment. The way to achieve such harmony is to take into account aesthetic needs in all aspects of our lives, from the development of technologies to the organisation of the surrounding space. This is the only way to achieve true beauty and harmony in the modern world.

The technical aesthetics of aerospace engineering not only contributes to the effective interaction of all components of the MMESE, but also becomes a factor in the spiritual and existential harmony of a person. Aerospace aesthetics unites all parts of the industry, from the design of aircraft and rockets to the organisation of ergonomic space for staff and passenger service. The problem of «industrial stress» in aerospace is compensated by spiritual aesthetics, expressed in dreams of the sky, of visiting distant worlds, of the future. This aesthetic is the key to inspiration, creativity, innovation, and overall job satisfaction. Aerospace aesthetics harmonises relationships in the human-technology-environment system through the transmission of relevant values, namely:

1.Research: Aerospace aesthetics can embody the human desire to explore, discover and push the boundaries of knowledge and possibility.

2. Technological progress: It can reflect advances in technology, engineering and science, showing humanity's potential to achieve great solutions and breakthroughs.

3. Community: Participation in aerospace programmes can foster a sense of community that brings people from different countries and cultures together in a shared desire to achieve common goals.

4. Peace and cooperation: Aerospace projects often require cooperation between states and organisations, which contributes to international relations and peace.

ЛІТЕРАТУРА

1. Bushnell, D. M. Industrial Design in Aerospace. Role of Aesthetics / D. M. Bushnell (ed.). Hampton : Langley Research Center, 2006. URL: https://core.ac.uk/download/pdf/10517988.pdf.
2. Gibson, J. J. The theory of affordances: (1979). *The people, place, and space reader*. London : Routledge, 2014. С. 50–60.
3. Гнатюк Л. Р., Осадча К. М. Теорія естетичного формоутворення. *Теорія та практика дизайну.* 2012. Вип. 2. С. 92–97. URL: https://DOI:10.18372/2415–8151.2.6150.
4. ДСТУ 2429–94. Система «людина-машина». Ергономічні та техніко-естетичні вимоги. Терміни та визначення. Київ : Держспоживстандарт України, 1994. 29 с.

5. Long Sh., Dhillon B. Man-Machine-Environment System Engineering. *Lecture Notes in Electrical Engineering*: Proceedings of the 16th International Conference on MMESE. January 2016. URL: https://DOI:10.1007/978-981-10-2323-1.
6. Lopez M., Ammerman G., Myers P. Aesthetics of Technology. *Offramp*. 2017. 13. URL: https://offramp.sciarc.edu/issues/offramp-13.
7. Оксентюк Б. Поняття технічної естетики та ергономіки та їх значення при розробці нового товару. *Матеріали XV наукової конференції ТНТУ імені Івана Пулюя*. Тернопіль, 2011. С. 255. URL: https://elartu.tntu.edu.ua/bitstream/123456789/10728/2/ConfTNTU_2011_Oksentiuk_B-Poniattia_tekhnichnoi_estetyky_255.pdf.
8. Оленіна О., Проценко О., Пічугіна Ю. Статус мистецтва в сучасному цифровому просторі. *Культура України*. 2022. Вип. 78. С. 18–30.
9. Rugescu A., Rugescu R. D. Impact of High Technology on Esthetics. *Aerospace influence*. *IBSU Scientific Journal*. 2009. 1 (3). С. 59–71.
10. Сафронов В. К. Архітектурне середовище як простір об'єктів інформаційного впливу. *Технічна естетика та дизайн*. 2018. Вип. 14. С. 219–223.
11. Сидорчук Л. А. Концепція ергономічного проектування системи «людина-техніка-середовище». *Педагогічні науки*. 2013. Вип. 113. С. 182–191.
12. Сидорчук Л. А. Ергономічна культура майбутнього вчителя технологій : монографія. Київ: НПУ, 2010. 413 с.
13. Сидорчук Л. А. Ергономічні основи методологічних підходів до аналізу взаємодії в системі «людина – техніка». *Вісник Київського міжнародного університету.* Серія: Психологічні науки. 2007. С. 190–199. URL: https://enpuir.npu.edu.ua/bitstream/handle/123456789/9090/SIDORCHUK.pdf;jsessionid=F2ABD0D93FCF95D7CC0DFA514C2D7A09?sequence=1.
14. Татіївський П. Витоки і розвиток технічної естетики в Україні. *Мистецтво та освіта*. 2000. № 3. С. 7–10.
15. Ушно І. М. Філософія техніки та технології: історико-філософський контекст. *Наукове пізнання: методологія та технологія. Філософія*. 2023. № 2 (52). С. 30–36. URL: https://doi.org/10.24195/sk1561-1264/2023-2-4.
16. Wei Ch. Analysis of Man-machine-environment System in Industrial Design and Comprehensive Evaluation of Products. *Man-machine Relationship IOP Conf. Series : Materials Science and Engineering.* 2020. 746 012039. URL: https://doi:10.1088/1757-899X/746/1/012039.

REFERENCES

1. Bushnell, D. M. (2006). Industrial Design in Aerospace. Role of Aesthetics. D. M. Bushnell (ed.). Hampton: Langley Research Center. URL: https://core.ac.uk/download/pdf/10517988.pdf.
2. Gibson, J. J. (2014). The theory of affordances: (1979). *The people, place, and space reader*. London: Routledge, *50–60.*
3. Gnatjuk, L. R., Osadchaja, K. M. (2012). Aesthetic theory formation industrial products. *Teoriia ta praktyka dyzaina – Theory and practice of design, 2, 92–97*. doi: https://doi:10.18372/2415–8151.2.6150

4. DSTU 2429–94. (1994). Man-machine system. Ergonomic and technical and aesthetic requirements. Terms and definitions. Kyiv: Derzhspozhyvstandart Ukrainy [in Ukrainian].
5. Long, Sh., Bikram, D. (2016). Man-Machine-Environment System Engineering. *Lecture Notes in Electrical Engineering*: proceedings of the 16th International Conference on MMESE, *406.* doi: https://doi:10.1007/978-981-10-2323-1
6. Lopez, M., Ammerman, G., Myers, P. (2017). Aesthetics of Technology. *Offramp, 13.* URL: https://offramp.sciarc.edu/issues/offramp-13
7. Oksentiuk, B. (2011). The concept of technical aesthetics and ergonomics and their importance in the development of a new product. *Proceedings of the XV Scientific Conference of Ivan Puluj.* Ternopil: Ternopil National Technical University, *255.* URL: https://elartu.tntu.edu.ua/bitstream/123456789/10728/2/ConfTNTU_2011_Oksentiuk_B-Poniattia_tekhnichnoi_estetyky_255.pdf [in Ukrainian].
8. Olenina, O., Protsenko, O., Pichuhina, Y. (2022). Status of art in the modern digital space. *Kultura Ukrainy – Culture of Ukraine, issue 78, 18–30* [in Ukrainian].
9. Rugescu, A., Rugescu, R. D. (2009). Impact of High Technology on Esthetics. *Aerospace influence. IBSU Scientific Journal*, *1(3), 59–71.*
10. Safronov, V. K. (2018). Architectural environment as a space of objects of information influence. *Tekhnichna estetyka ta dyzain – Technical Aesthetics and Design*, *14, 219–223* [in Ukrainian].
11. Sydorchuk, L. A. (2013). The concept of ergonomic design of the «human-technology-environment» system. *Pedahohichni nauky – Pedagogical Sciences*, *113, 182–191* [in Ukrainian].
12. Sydorchuk, L. A. (2010). Ergonomic culture of the future teacher of technology: a monograph. Kyiv: NPU [in Ukrainian].
13. Sidorchuk, L. A. (2013). The concept of ergonomic design of the system «man-technology-environment». *Visnyk Kyivskoho mizhnarodnoho universytetu. Seriia: Psykholohichni nauky – Bulletin of Kyiv International University. Series: Psychological sciences*, *113, 182–191*.URL: https://enpuir.npu.edu.ua/bitstream/handle/123456789/9090/SIDORCHUK.pdf;jsessionid=F2ABD0D93FCF95D7CC0DFA514C2D7A09?sequence=1[in Ukrainian].
14. Tatiyevsky, P. (2000). Origins and development of technical aesthetics in Ukraine. *Mystetstvo ta osvita – Art and Education*, *3, 7–10* [in Ukrainian].
15. Ushno, I. (2023). Philosophy of Technology and Technology: historical and philosophical context. *Naukove piznannia: metodolohiia ta tekhnolohiia. Filosofii*. – *Scientific knowledge: Methodology and Technology. Philosophy*. Odesa: Publishing house «Helvetica», *2 (52), 30–36.* doi: https://doi.org/10.24195/sk1561-1264/2023-2-4 [in Ukrainian].
16. Wei, Ch. (2020). Analysis of Man-machine-environment System in Industrial Design and Comprehensive Evaluation of Products. *Man-machine Relationship IOP Conf. Series: Materials Science and Engineering*. *746 012039*. doi: https://doi:10.1088/1757-899X/746/1/012039

Ушно Ірина Михайлівна, кандидат філософських наук, доцент кафедри філософії та суспільних наук, Національний аерокосмічний університет імені М. Є. Жуковського «ХАІ», Україна

ЕСТЕТИКА В СИСТЕМІ «ЛЮДИНА-ТЕХНІКА-СЕРЕДОВИЩЕ»: ПОШУК ГАРМОНІЇ

Сучасна система «людина-техніка-середовище» (СЛТС) охоплює велике коло питань, пов'язаних між собою. Розглядати таку систему можливо в різних координатах: безпека, ефективність, глобалізація тощо. Метою цієї статті є дослідження естетичного виміру СЛТС в аерокосмічному контексті. У широкому сенсі естетика постає як простір для реалізації системи «людина-техніка-середовище». У практичній діяльності, естетика є показником гармонійної взаємодії всіх складників цієї системи. Естетичний складник виступає каталізатором змін, зумовлює упровадження вдосконалень та нових рішень у професійному середовищі. У системі «людина-техніка-середовище» технічна естетика дає змогу актуалізувати питання задоволення, натхнення, а також ергономіки та комфорту аерокосмічного інжинірингу.

Ключові слова: *технічна естетика, аерокосмічний інжиніринг, людина, техніка, середовище, цінності.*