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**THE INFLUENCE OF HUMAN CAPITAL AND PERSONNEL POTENTIAL ON THE
STATE OF PERSONNEL AND FINANCIAL AND ECONOMIC SECURITY OF CRITICAL
INFRASTRUCTURE FACILITIES**

The impact of human capital and personnel potential on the state of personnel and financial and economic security of critical infrastructure facilities is as follows. Qualitative characteristics of human capital that form the personnel resource of critical infrastructure enterprises, such as business activity, initiative, professional behaviour and business ethics, discipline, time management, self-development, self-management, lifelong learning, the level of soft skills and hard skills, their application in professional activity, age, economic expectations, level of education, physical training, stress resistance, state of health, level of qualification, experience and competence can have both positive and negative consequences for the state of their personnel security, as well as for the final result for the state of financial and economic security. The main threats to the state of financial and economic security of critical infrastructure objects, which are formed by the behaviour of their personnel, are outlined. Taking into account the experience of various market participants, a number of significant difficulties and shortcomings have been identified, which already affect, or which in the future may affect the state of financial and economic security of critical infrastructure objects, and which are related to the state of their human resource and its quality characteristics. The impact of human capital and personnel potential on the state of personnel and financial and economic security of critical infrastructure facilities is specified.

Keywords: *human capital, personnel potential, personnel resource, critical infrastructure, risk, financial and economic security, personnel security.*

Introduction. Since the beginning of the full-scale invasion, the attention of state authorities, the world community, foreign partners of Ukraine and international organizations has been focused on the physical preservation of critical infrastructure objects, because their destruction can have catastrophic social and economic consequences, which will be difficult to minimize with the resources available in the war economy. At the same time, the state of financial and economic security of strategically important enterprises also needs to be controlled, because stopping their activities due to economic reasons can cause almost similar consequences on the life of the population and business. It is also worth considering the fact that the economic condition of critical infrastructure facilities and other domestic economic entities was unbalanced as a result of long lockdowns and other negative consequences of the global pandemic. The global pandemic has become a real test for business development in all countries of the world. At the beginning of 2021, UN experts predicted that by 2025 the total amount of losses from the economic crisis caused by the pandemic will reach 22 trillion dollars. In addition to this, since 2022, Ukraine is in a state of war, which leaves no state resources for the support and development of enterprises in other, except military, industries. Under such conditions, the restoration and stabilization of the state of financial and economic security of the business entity becomes the task of its management staff and owners only. And the first resource that traditionally begins to be used in the absence of adequate financial and material support is the personnel potential of enterprises. But the global pandemic, the prolonged economic crisis, and finally the war became factors of significant influence on

the human capital of Ukraine, and also caused a significant decrease in the level of intellectual capital of domestic enterprises. Therefore, we must realize the problems of preserving human capital if we aim to restore the economy of Ukraine in the post-war period. And the first step of such a recovery should be the first physical, and then the financial and economic revival of the critical infrastructure.

Literature review. The question of maintaining the appropriate level of financial and economic security of critical infrastructure objects was raised by Ukrainian researchers even in peacetime, taking into account the difficult economic conditions of the functioning of domestic business. For example, O. Brozhko, S. Sokotenyuk studied the current state and directions for increasing the level of economic security of critical infrastructures of Ukraine [1], V. Loyko, V. Khrapkina, S. Malyar, M. Rudenko specified the economic and legal principles of ensuring the protection of critical infrastructure [2]. Already in 2023, the issue of restoration and further functioning of strategically important enterprises, as well as the search for resources for the organization and implementation of these processes, began to be actively discussed. For example, Kyzym M., Haustova V., Trushkina N. study the possibilities of financial support for the development of critical infrastructure in the conditions of the post-war reconstruction of the Ukrainian economy [3].

In addition to the financial issue, a significant role should also be given to human resources of appropriate quality, which is confirmed in the publication of such scientists as S. Belai, I. Yevtushenko, and V. Matsyuk, which is devoted to the theoretical and methodological principles of personnel training in the field protection of critical infrastructure of Ukraine [4]. Wide discussion at different levels of the problem of Ukraine's loss of human capital was reflected in the scientific and publishing activity of such researchers as Kharechko D., who analyzes the formation and implementation of state social and economic policy in the context of the reproduction of human capital in a special period [5], Antoniuk V., which substantiates the assumption that intellectual and human capital in the conditions of the information and innovation economy is a key factor in the adaptation and economic security of the enterprise [8]. The analysis of the materials of the mentioned literary sources allows us to come to the conclusion that the financial and economic security of critical infrastructure objects needs to be restored; in the future, it must be effectively managed to ensure the stability and profitability of the functioning of strategically important enterprises, and without properly qualified personnel it will be impossible to perform this task.

The **purpose** of the study is to specify the influence of human capital and personnel potential on the state of personnel and financial and economic security of critical infrastructure objects in wartime and in the postwar period.

Results and discussion. The management of domestic critical infrastructure objects faces an urgent need to develop new approaches to ensuring their financial and economic security, taking into account the realities of the work of enterprises in wartime, during quarantine, a possible stoppage of their financial and economic activity in the conditions of another lockdown, blackout and transfer of employees to remote work, and business entities themselves to online customer service.

The main problems faced by professionals in the management of financial and economic security at critical infrastructure enterprises in the conditions of quarantine restrictions and since the beginning of military operations were:

- lack of funds and necessary equipment to ensure the security of enterprise resources during periods of remote work or after transfers (in positions and processes where it was technically possible to organize it);

- lack of understanding by management personnel of their functions and tasks in new conditions; lack of an algorithm of actions in similar situations, including for employees of financial and economic security services;

- the inability of enterprise employees to self-organize and establish working relationships in a remote format and under the risks of war, which led to inefficient use of working time, reduced profits, losses and the impossibility of meeting the needs of consumers in a timely manner;

- lack of protocols for protecting employees' personal equipment, which they began to use for professional purposes, including when working with clients and company information and client data;

- the need to check new partners, suppliers, contractors to replace those who could not organize their work in new conditions or were affiliated with the aggressor country; working with the latter to obtain compensation for unfulfilled obligations in court or individually;
- the need to work with clients in the legal sphere regarding unfulfilled obligations by the company due to forced work stoppages during periods of quarantine and lockdown, during air raids, attacks; assessment of the risks of court costs, fines, penalties, penalties in case of initiation of legal proceedings;
- limited access to information and other resources in connection with the restructuring of the work of various bases and services under the new conditions of remote service.

At the moment when the period of adaptation to the new working conditions at most critical infrastructure enterprises had already passed, and the necessary measures regarding the organization of work had been taken, the problem of the lack of documents that would determine the strategic vectors of the functioning and development of the economic security systems of economic structures arose, especially clearly. We believe that now is the time for their development, taking into account all the new realities, threats, risks and dangers brought by first the global pandemic, and now the war. It should not be forgotten that any change can mean both negative consequences (in this case for business) and new opportunities with the correct response to challenges that have formed in the external and internal environment of business structures. And professionals in the management of financial and economic security are called to deal with the development of such a reaction as the first line of defense of the economic interests of critical infrastructure objects and their stakeholders against various dangers and threats.

Based on this, it is worth taking a closer look at the state of the strategic and personnel aspects of the process of ensuring the economic security of modern critical infrastructure facilities. As it was mentioned, there is a lack of economic security strategies or other documents in the practice of business entities that would determine the strategic orientations of financial and economic security management both under the conditions of martial law and quarantine restrictions, and during periods of their normal continuous work. The nearest strategic goals may consist in the autonomy of the financial and economic security system, its construction, modernization or renewal using a project approach - in which persons responsible for various functional areas of economic security will form a team that will have its own leader and will be able to work remotely, using flexible schedule and using project management technologies. With this approach, the organization of the financial and economic security system will be considered a separate project of the company, and the assessment of success at its completion will be the achieved level of financial and economic security of the enterprise, which should still be trained to evaluate the personnel to whose functions this task will be assigned. This leads to the problem of staffing resources for managing financial and economic security. It is obvious that earlier this function relied on former employees of law enforcement agencies in view of the typology of those threats and risks that were characteristic of business entities. However, now the management of financial and economic security requires the possession of such competencies as searching, evaluating and analyzing data, analyzing financial information, working with personnel, assessing their professional suitability and personal qualities, managing risks, knowing foreign languages, working with computer programs and social networks, the ability to communicate, mediate, negotiate and resolve conflicts, etc. Thus, the need for close cooperation between the spheres of education and business in the field of training of professionals in the management of financial and economic security by institutions of higher education emerges. Currently, the labor market lacks such specialists; part of the employees capable of performing the defined tasks left the country. Therefore, the domestic labor market needs human capital, which will possess the necessary competencies to manage the financial and economic security of business entities, as well as human resources to restore the intellectual and personnel security of strategically important enterprises.

The loss of human capital and personnel potential as a result of the war actualizes the problem of ensuring personnel security of critical infrastructure facilities. Modern scientists single out several approaches to the formation of a system of intellectual and personnel security of a business entity and to the process of its management. In particular, these are such approaches as target, structural, process,

functional. Among the components of personnel security, the following are most often voiced: physical and psychological security, health security, financial, intellectual and career security [9, p.72].

As for the issue of assessing the level of personnel security, it may be appropriate to use several sets (aggregates) of indicators at once: indicators of the motivational component of personnel security; a set of indicators that reflect the provision and efficiency of the use of personnel; a set of indicators for ensuring the protection of personnel's vital activities; set of indicators of the professional component of personnel security; set of indicators of the social component of personnel security; set of assessment of personnel security system [10, p.71].

Therefore, personnel security is "one of the components of economic security, which should be considered as a set of conditions under which dangerous and unfavorable circumstances and actions are eliminated before they occur or their negative consequences are minimized to the level at which they are unable to cause damage or harm to the enterprise, weaken its financial condition and prevent the company from achieving its strategic goals. Also, personnel security can be considered from different angles - both financial and intellectual (which contributes to the improvement of the company's activities), and physical and career-administrative (unbiased assessment of the employee's activity and capabilities and his promotion)" [11, p.88].

The need to ensure personnel security at critical infrastructure facilities arises from the fact that the company's personnel are a source of numerous personnel risks and threats that originate from their actions and may have an impact on the state of financial and economic security of the business entity. In wartime, in conditions of economic instability and after the tangible consequences of the global pandemic of COVID-19, the behavior of employees has changed significantly, and the number of personnel risks has increased. We will outline the main threats to the state of financial and economic security of critical infrastructure objects, which are formed by the behavior of their personnel.

1. Fraud, theft, deception - these actions on the part of personnel can be committed with the aim of taking over the company's resources for personal use, causing damage to the business entity's activities, its reputation at the behest of competing organizations, or to justify their actions or inaction during the performance of professional duties responsibilities. The propensity of employees to such behavior should be determined by specialists of the personnel department (HR department) at the stage of hiring, during a personal interview with a candidate for a position: this approach is quite effective and allows you to avoid hiring people prone to fraud. However, the radical changes in the organization and implementation of labor relations caused by the transition to the online mode of work created a "good" basis for the dishonest behavior of those employees who were not sufficiently motivated, loyal to their company and saw in the new conditions of the organization of the labor process an opportunity for themselves to contribute less effort and receive personal profit during the working day.

2. Low qualification of workers, their inability or unwillingness to adapt to new working conditions. The mass departure of able-bodied people abroad, first of all from the occupied territories, and from the rest of the regions of Ukraine in an attempt to protect themselves from the threats of war, intensified the trend of "brain drain", provoked "personnel hunger" in companies, exhausted the labor market in the segment of highly qualified specialists, which formed the intellectual potential of the nation and should become human capital for economic development in the future. Human resource managers of business entities had to quickly find replacements for employees who left their positions due to the war, without proper verification and without a procedure for adapting employees to workplaces. This can disrupt the normal course of business processes, worsen the functional state of enterprises, and in the public administration sector or at critical infrastructure facilities, lead to the appearance of risks to the state of national security. Therefore, personnel management, both in peacetime and under martial law, needs to form personnel reserves in advance and have alternative sources for replenishing the staff.

3. Irrational behavior of personnel during air alarms, blackouts, etc. Observance of discipline and norms of behavior in the workplace are now very important factors that can not only regulate the actions of employees and reduce the level of uncertainty for HR management, but also ensure the physical survival of a person, preserve his health, which is the most valuable not only economically, but also and a personal resource. However, over time, in relatively safe regions of Ukraine, employees of enterprises, institutions, and organizations began to perceive air alarms not as a signal to move from the workplace

to shelter, but as an opportunity to attend to personal matters - on the territory of the enterprise or outside it. From a legal point of view, such behavior is a big risk – legal, economic and reputational – for the subject of economic activity. Therefore, in order to maintain the level of personnel security in this vector, it is suggested to develop (if it does not already exist) a clear algorithm of personnel actions during an air alert, to inform each employee about the responsibility for violating the accepted rules and to organize measures to control the implementation of specified procedures. Stimulating and encouraging those who will demonstrate exemplary behavior and motivate the rest of the staff by their own example can be a good practice both to increase the level of discipline and to improve the team spirit in the team.

In the conditions of quarantine restrictions and lockdowns, the introduction of which has a significant impact on the functioning and development of global and domestic business, a major managerial problem and challenge for the top management of companies has become the organization of remote work of personnel. It is especially important to ensure the efficiency and rationality of this process at critical infrastructure facilities in order to ensure the continuity of their operation under any conditions. At first, even a general understanding of how work processes can be adjusted in the absence of workers of certain positions at their workplace was lacking. However, with the passage of time and taking into account the experience of various market participants, the restructuring of the labor relations model (where possible) did take place, and now, at the end of 2023, the organization of remote work will not surprise anyone. However, the formation of certain experience in this area made it possible to identify a number of significant difficulties and shortcomings that already affect, or that in the future may affect the state of financial and economic security of critical infrastructure objects.

1. Material support of remote work. Partly (and in some cases – completely) the function of organizing a remote workplace has been transferred to the employee, which has led to the use of their own personal devices to store work information, which is recognized worldwide as an unsuccessful and sometimes unacceptable practice. Also, separate technical requirements for remote work meant additional costs for employees, which caused dissatisfaction and a decrease in the level of loyalty to the company.

2. Technical problems of connection and communication. Remote work requires employees to have a higher level of information literacy and mastery of modern technologies. Their use without due attention to the issue of data security can become a significant threat to the informational and, ultimately, the financial and economic security of an enterprise, institution, organization, and in the case of a critical infrastructure object, even to the national security of the state.

3. Efficiency of work in conditions of lack of supervision. Remote work is characterized by a relatively low level of supervision, monitoring and control, at least of the work process. Therefore, it is worth establishing a close control over the work results, intermediate and final. Employees of companies must demonstrate a high level of discipline, awareness of the need to conscientiously and timely fulfill their professional duties in conditions of lack of control. The company's top management can stimulate the most productive employees, first of all, by improving their working conditions - through the purchase of new gadgets, personal computers and other equipment that is actively used in remote work conditions.

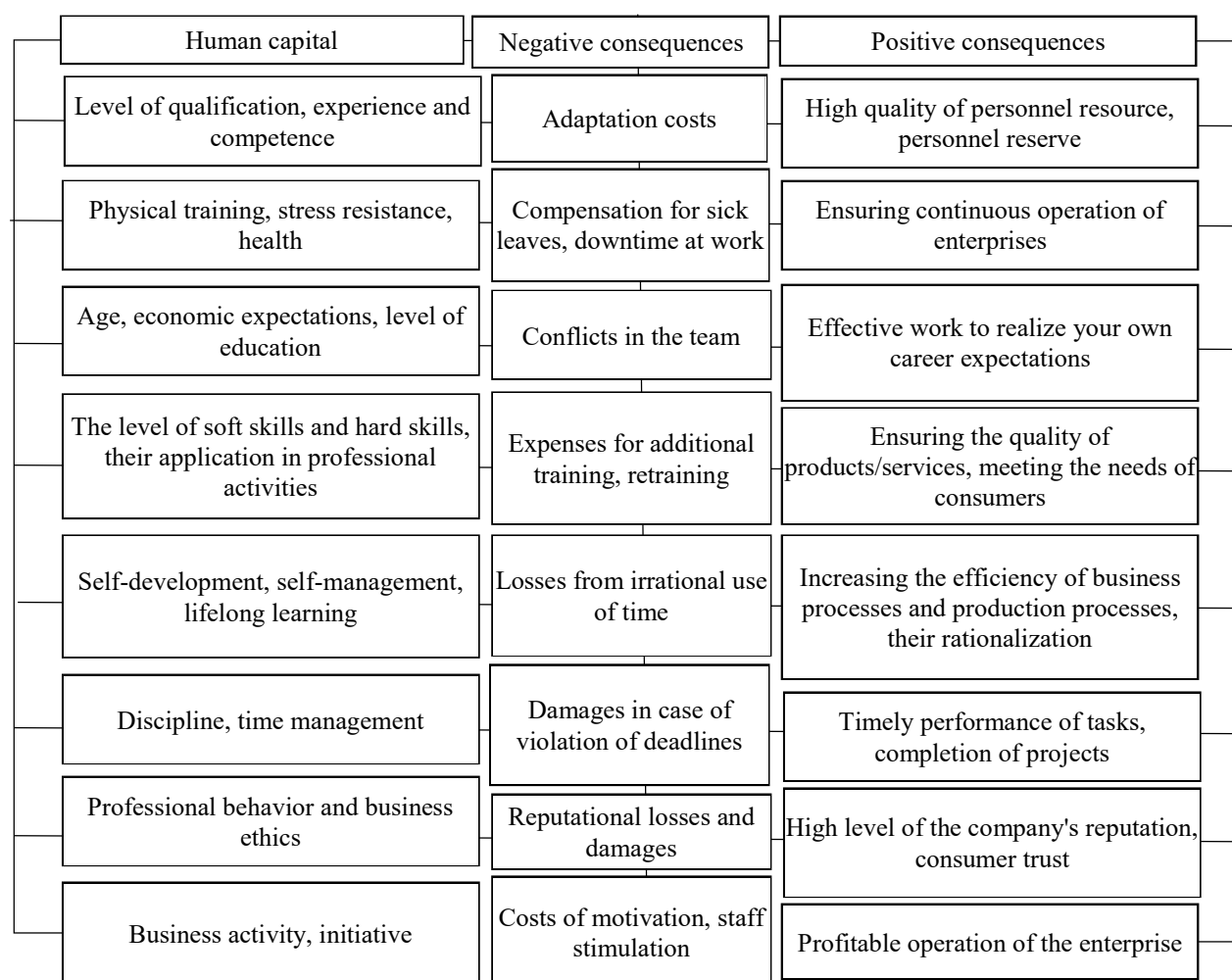
4. Social passivity and professional burnout. Lack of personal communication, direct communication with colleagues, isolation - negatively affect the psychological and emotional state of employees of enterprises, which can affect the efficiency and effectiveness of their work and even cause the development of depression and other diseases.

5. Chronophages and distracting factors. In many cases, the effectiveness of remote work of employees is affected by the presence of other persons in the premises - children, family members who are also isolated for one reason or another (for example, quarantine or air raid) and have to perform certain tasks online (study or work). As for chronophages - time wasters, this is a term from the field of time management, which means unproductive use of time - distraction on phone conversations, social networks, coffee, "smoke breaks", etc.

Thus, the remote form of work process organization is a real challenge of the time for domestic critical infrastructure facilities. However, like any change, it can also have its advantages with the reasonable use of personnel potential, time and material resources of business entities and own resources and means of their employees [12].

Therefore, the personnel of critical infrastructure facilities are a source for the formation and intensification of a large number of risks and threats to their financial and economic condition. At the same time, a high-quality human resource is a significant competitive advantage of a strategic enterprise, which can ensure its effective functioning, presence on the market and physical survival even in the absence of other types of corporate resources necessary for conducting a profitable business. In view of this, in the system of modern management, an important role should be assigned to the study of the possibility of increasing the level of financial and economic security of the economic entity through the mechanisms of personnel development, the formation of personnel potential, and the creation of a personnel management reserve.

Personnel development is a set of actions aimed at forming new competencies among employees based on their acquisition of new knowledge both from the list of professional skills and from the plane of social skills. Incentives for professional and personal development can be material rewards, contracts with attractive working conditions, career advancement, etc. The tools for this process are training (in the field of formal and non-formal education, including lifelong learning), course preparation (in offline and online modes), mentoring, mentoring, delegation of authority, rotation, planned and extraordinary professional development, etc.).



Picture 1 – The influence of human capital and personnel potential on the state of personnel and financial and economic security of critical infrastructure objects

Compiled by the author

The proliferation of online education has made tools for development and learning more accessible, and now only desire and the availability of free time are the factors that employees need to improve their personal and business skills. Therefore, the tasks of the management of critical infrastructure facilities are to arouse and stimulate the thirst of personnel to learn new skills, and at the

same time, to ensure the availability of a reserve of time for those who plan to spend it on professional development. Motivated employees who demonstrate readiness for continuous self-improvement are the basis of the company's personnel potential. Those of them who demonstrate the presence of leadership qualities and readiness to take responsibility for their own actions and for the actions of others should be included in the personnel management reserve.

Therefore, the management of personnel security of a critical infrastructure object in the system of ensuring its financial and economic security should be organized and implemented in two directions. The first is the protection of the corporate resources of the business entity against the actions or inaction of its own employees. The second is the protection of employees, as an important resource of the company, from the risks and threats that accompany them during the performance of their duties. The second direction is especially important during the war, and may require new non-standard approaches from the management of strategically important enterprises, which emphasizes the relevance and prospects of further scientific research in the direction of personnel security management of critical infrastructure facilities in the conditions of the wartime economy and in the post-war period.

Conclusions. The impact of human capital and personnel potential on the state of personnel and financial and economic security of critical infrastructure facilities is as follows. Qualitative characteristics of human capital that form the personnel resource of critical infrastructure enterprises, such as business activity, initiative, professional behavior and business ethics, discipline, time management, self-development, self-management, lifelong learning, the level of soft skills and hard skills, their application in professional activity, age, economic expectations, level of education, physical training, stress resistance, state of health, level of qualification, experience and competence can have both positive and negative consequences for the state of their personnel security, as well as for the final result for the state of their financial and economic security. Positive consequences include: a high level of the company's reputation, consumer trust; timely completion of tasks, completion of projects; increasing the efficiency of business processes and production processes, their rationalization; profitable operation of the enterprise; effective work to realize own career expectations; ensuring continuous operation of enterprises; high quality of personnel resource, personnel reserve; ensuring the quality of products/services, meeting the needs of consumers. Negative manifestations of the lack of a number of important qualitative characteristics for the state of their financial and economic security in the personnel resources of critical infrastructure enterprises can be: costs for personnel adaptation; compensation for sick leaves, downtime at work; conflicts in the team; expenses for additional training, retraining; losses from irrational use of time; damages in case of violation of deadlines; reputational losses and damages; spending motivation, staff stimulation.

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ВПЛИВ ЛЮДСЬКОГО КАПІТАЛУ ТА КАДРОВОГО ПОТЕНЦІАЛУ НА СТАН КАДРОВОЇ ТА ФІНАНСОВО-ЕКОНОМІЧНОЇ БЕЗПЕКИ ОБ'ЄКТІВ КРИТИЧНОЇ ІНФРАСТРУКТУРИ

Вступ. З моменту початку повномасштабного вторгнення увага державних органів влади, світової громадськості, іноземних партнерів України та міжнародних організацій зосереджена на фізичному збереженні об'єктів критичної інфраструктури, адже їх руйнування може мати катастрофічні соціальні та економічні наслідки, які важко буде нівелювати наявними у воєнній економіці ресурсами. Глобальна пандемія, тривала економічна криза, і врешті війна стали факторами суттєвого впливу на людський капітал України, а також спричинили суттєве зменшення рівня інтелектуального капіталу вітчизняних підприємств. Відтак, ми повинні усвідомити проблеми збереження людського капіталу, якщо маємо на меті відновити економіку України у післявоєнний період. І першим кроком такого відновлення буде спочатку фізичне, а потім фінансово-економічне відродження критичної інфраструктури.

Мета: конкретизувати вплив людського капіталу та кадрового потенціалу на стан кадрової та фінансово-економічної безпеки об'єктів критичної інфраструктури у воєнний час і у післявоєнний період.

Результати. Вплив людського капіталу та кадрового потенціалу на стан кадрової та фінансово-економічної безпеки об'єктів критичної інфраструктури полягає у наступному. Якісні характеристики людського капіталу, що формують кадровий ресурс підприємств критичної інфраструктури, такі як ділова активність, ініціативність, професійна поведінка та ділова етика, дисциплінованість, тайм-менеджмент, саморозвиток, самоменеджмент, навчання впродовж життя, рівень soft skills і hard skills, їх застосування у професійній діяльності, вік, економічні очікування, рівень освіти, фізична підготовка, стресостійкість, стан здоров'я, рівень кваліфікації, досвіду та компетентності можуть мати як позитивні, так і негативні наслідки для стану їх кадрової безпеки, а також у кінцевому результаті і для фінансово-економічної безпеки.

Оригінальність. Окреслено основні загрози для стану фінансово-економічної безпеки об'єктів критичної інфраструктури, що формуються поведінкою їх персоналу. Із урахуванням досвіду різноманітних учасників ринку виявлено ряд суттєвих труднощів і недоліків, які уже впливають, або які у перспективі можуть вплинути на стан фінансово-економічної безпеки об'єктів критичної інфраструктури, і які пов'язані зі станом їх кадрового ресурсу та його якісними характеристиками. Конкретизовано вплив людського капіталу та кадрового потенціалу на стан кадрової та фінансово-економічної безпеки об'єктів критичної інфраструктури.

Висновок. До позитивних наслідків, які через раціональну поведінку кадрового ресурсу може отримати об'єкт критичної інфраструктури, слід віднести: високий рівень репутації підприємства, довіри споживачів; своєчасне виконання завдань, завершення проєктів; підвищення ефективності бізнес-процесів і виробничих процесів, їх раціоналізація; рентабельна робота підприємства; ефективна робота для реалізації власних кар'єрних очікувань; забезпечення безперервної роботи підприємств; висока якість кадрового ресурсу, кадрового резерву; забезпечення якості продуктів / послуг, задоволення потреб споживачів. Негативними проявами відсутності у кадрового ресурсу підприємств критичної інфраструктури ряду важливих якісних характеристик для стану їх фінансово-економічної безпеки можуть стати: витрати на адаптацію персоналу; компенсації лікарняних листів, простоїв у роботі; конфлікти у колективі; витрати на додаткове навчання, перенавчання; втрати від нераціонального використання часу; збитки при порушенні дедлайнів; репутаційні втрати та збитки; витрати на мотивацію, стимулювання персоналу.

Ключові слова: людський капітал, кадровий потенціал, кадровий ресурс, критична інфраструктура, ризик, фінансово-економічна безпека, кадрова безпека.

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