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The twenty-eighth collection issue presents relevant content on forensic science, theory and methods of forensic science, as well as work on practical issues of different classes, kinds, species and subspecies of forensic science. Content providing information about international conferences on the issues of criminalistics and forensic science are given.

Our authors are representatives of forensic science institutions, higher education institutions, law enforcement agencies of Ukraine and other countries.

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International Scientific Standards in Forensic Science Field of Ukraine

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Science is an important driver of Ukrainian development on the way to its strengthening, economic and social progress. Science daily transforms various aspects of our lives and especially significantly affects the areas meeting the needs of our State. In current conditions, Ukraine uses modern technologies to fight the enemy and skillfully uses achievements to protect its own citizens. Military challenges that Ukraine adequately overcomes every day, encourage new system construction of relations between science and society, increase its relevance for further progress, innovative prosperity and for strengthening defense capacity.

Ukrainian scientists are actively directing their potential to the victory and development of our State. Current urgent need is application of international standards and experience in domestic forensic science field in order to ensure high-quality forensic science field in Ukraine. It should be noted that creation of unified approaches to solving issues in forensic science support to justice will have a positive impact on justice transparency in the State.

International cooperation in the field of forensic science activity is a powerfully developed system that subtly responds to influence of a wide variety of factors. Strengthening international cooperation always meets interests of forensic experts, forensic science institutions, judicial system, law enforcement agencies, individual citizens and civil society as a whole.

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Among the main reasons that nowadays encouraging forensic experts to intensify international cooperation are globalization in all fields of human activity, rapid development of communication means, international scientific relations, population migration acceleration and international transnational organized crime activation associated with these processes and international terrorism. In the fight against crime and terrorism, as well as in matters of human rights protection, role of forensic science growing day by day is difficult to overestimate. Law enforcement officers always involve forensic experts in criminal proceedings to investigate crimes committed under martial law. Forensic expert conclusions are important sources of information while research on weapons of various calibers, missiles, explosives, narcotic substances, examinations of damage and destruction as a result of missile strikes and bombings. DNA research is particularly important at the moment, providing opportunity to obtain information about deceased persons and find their relatives in the shortest possible time.

Formation of unified international standards can be implemented in various ways, in particular: exchange of information on research and development, as well as on new educational, methodological and reference publications; conducting scientific conferences, workshops, exhibitions, round tables, etc. in the field of criminalistics and forensic science; coordinating scientific work on forensic examination issues in the form of joint development of methods and techniques of forensic science, implementation of scientific developments; training and advanced staff training; mutual review of scientific developments, forensic expert conclusions; providing scientific,

methodological, advisory and technical assistance on scientific and forensic science activities.

For a long time, there has been an active interaction and exchange of experience within the framework of *European Network of Forensic Science Institutes (ENFSI)*. *ENFSI* is one of the most authoritative forensic science institutions in the world: all leading European forensic science institutions belong to this network. It should be noted that National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute» has been an *ENFSI* member since 2018 and takes an active part in organized events.

Important aspect for cooperation in the forensic science field is *CEPOL* exchange program. *European Union Agency for Law Enforcement Training (CEPOL)* that aims to strengthen cooperation in the fight against crime through training and allows participants to get acquainted with working methods of other countries, contributing to building trust and enhancing interaction between law enforcement officers and forensic science organizations throughout Europe and beyond. Participation in *CEPOL* programs for Ukrainian partners is to some extent limited or even impossible due to the risks provoked by Russian aggression against Ukraine. However, immediately after the victory of Ukraine, cooperation within *CEPOL* will continue.

The *Theory and Practice of Forensic Science and Criminalistics* research paper collection editorial board actively supports the interaction of scientists and the dissemination of published articles through international scientific online databases. The research paper collection: *Theory and Practice of Forensic Science and Criminalistics* is indexed in the following databases: *Academic Scientific Journals Indexing*, *Bielefeld Academic Search Engine*

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The issue № 28 of *Theory and Practice of Forensic Science and Criminalistics* research paper collection raises topical issues that will interest as Ukrainian scientists as international partners. An article on the topic: *Modern problems of criminalistics in conditions of war and global threats* by **Viktor Shevchuk**, Doctor of Law, Professor (Ukraine) opens a traditional section: *Research Papers*. The author identified and analyzed the main trends in formation and development of forensic science in current realities and outlined promising directions for its scientific research; substantiated emergence and formation of new areas of criminalistics due to scientific progress, introduction of the latest technologies, need to identify specific traces and collect evidence (genomic, digital, nuclear, etc.).

In war conditions in Ukraine, formation of a new scientific direction of military criminalistics is urgent: its object, topic, system and tasks are defined. The scientist thoroughly researched on issues of formation and development of European criminalistics, integration issue of Ukrainian criminalistics into a single European criminalistics space, peculiarities of development and implementation of innovative products in law enforcement practice, taking into account positive international experience in the field of combating crime.

Article on the topic: *The Role of Leadership Style in Asset Misappropriation: An Ethnography Study* by Indonesian colleagues **Azizah Fattih Reziyah Adji** and **Anis Chariri**, PhD in accounting examines social and cultural causes illegal appropriation of assets by institution employees. Asset misappropriation is a professional fraud scheme that is often committed repeatedly, with approximately 86% of crimes perpetrated in 2022 and ranked first (according to a statement from Association of Certified Fraud Examiners). The main research issue is leadership style can shape the organizational culture and become one of provocative factors for misappropriation of assets in organization. In addition, research paper concludes that leaders are able to shape and implement organizational culture and fraud (as a social reality) can be provoked by leadership style. Aspects of multiparadigm in accounting are due to its combination with other branches.

Boris Geller (Israel) and **Nataliia Martynenko** (Ukraine) devoted their work to forensic aspect of combating corruption related crimes. Co-authors analyzed activities of specialized bodies of anti-corruption system and its mechanisms in Ukraine and Israel, outlined possibilities

and role of forensic science (specific expertise application) for investigating corruption related crimes and improving anti-corruption legislation.

Ivan Yatsenko, Doctor of Veterinary Medicine, Professor (Ukraine) in his research paper investigated in detail the role of forensic veterinarian as a subject of procedural legal relations and forensic science activity. The author proposed an expanded definition of *forensic veterinarian*, carefully worked out theoretical aspects of forensic veterinary expertise in order to fill the theoretical base of this expert direction. The article argues that special criteria for determining the procedural status of a forensic veterinarian detail the specifics of his professional activity in forensic science support to justice system that is determined by his special veterinary knowledge. Procedural criteria of forensic veterinarian status indicate his position in the proceedings, in particular: he belongs to the participants in the proceedings and performs auxiliary functions in; does not represent his own interests in the proceedings; has no material and legal interest in the results of proceedings; forensic veterinarian data are entered in the State Register of Forensic Experts (although this criterion is not mandatory).

Case Notes section begins with an article by the team of authors: **Yevheniia Kovkina**, PhD in Philology (Ukraine), **Margarita Aloyan** (Armenia) and **Lilya Avoyan** (Armenia). The paper considers possibilities of applying linguistic knowledge in the legal field (in particular, in criminal cases of incriminating a threat). The Authors draw attention to relevance of the research on speech act of threat, due to complexity of the conceptual content of this communicative act. The researchers determined the topic of the linguistic

semantic and textual examination of speech regarding establishment of statements expressed in the form of threat, specified the objects, outlined range of tasks of semantic and textual research, taking into account legal norm disposition. It is noted that forensic conclusion based on the results of linguistic examination of speech is often one of powerful means for making a court decision, as well as a significant argument during the pre-trial investigation in criminal cases regarding threat incrimination.

Vitalii Varlahov (Ukraine), PhD in Law, **Oleksandr Sviderskyi** Senior Researcher (Ukraine) and **Valentinas Mitunevicius** (Lithuania) Doctor of Technology consider the issue of the specialist's participation in crime scene reconstruction to investigate circumstances of traffic collision that took place in the dark. General requirements for preparation and conducting of crime scene reconstructions in criminal proceedings for investigation of traffic accidents that occurred at night, as well as specialist functions and peculiarities of his specific expertise application in such an experiment (finding out traffic collision mechanism; obtaining data for appointment of road accident analysis; verification of circumstances relevant to criminal proceedings). Aspects of interaction of pre-trial investigation bodies with a specialist in the field of road accident analysis during investigation of criminal offenses regarding traffic collisions are analyzed. It has been proven that a fast and high-quality pre-trial investigation is possible only if conducted investigative experiment meets the requirements stipulated by criminal procedure and methodical approaches used in forensic practice for determining visibility in the dark are

observed. Crime scene reconstruction, conducted with involvement of specialist in the field of road accident analysis ensures compliance of the specified investigative action with methodological recommendations for their conducting and has a positive effect on pre-trial investigation quality.

Vladyslav Fedorchenko (Ukraine), **Pavlo Horobrih** (Ukraine) and Professor of Social Sciences in the field of legal sciences **Leszek Wieczorek** (Poland) in their research paper consider the issues solved by road accident analysis regarding technical failures (and their causes) of the braking system of the vehicle in case of a traffic collision. The authors analyzed in detail the methods, purpose and objectives of such research and the parameters of braking of electric cars, which result identified possible consequences of malfunctions of vehicle brake system the and outlined ways to further investigate traffic collision after determining braking coefficients for electric cars. The result of this research was development of a new research direction in the field of forensic road accident analysis where the research object is cars with electric and hybrid power units, solving issues regarding technical possibility of preventing traffic collisions involving electric cars and coordinating cooperation with investigative bodies while forensic examination.

Paper co-authors of *Influence of Anti-Lock Braking System on Driving Car, Principle of its Operation in Critical Situation* — **Bogdan Chorniy** (Ukraine) and **Giorgi Tvalavadze** (Georgia) — aimed to determine the structure and operation principle, advantages and disadvantages of the anti-lock braking system (ABS), as well as the level of car safety in the case of using ABS for application of obtained data in forensic road accident

analysis. Up to 70% of accidents occur when drivers use emergency braking mode, up to 60% are accompanied by loss of stability and controllability. The car brake system should create braking torques on wheel axles allowing the driver to speed control of the vehicle and bring it to a standstill. As a friction result of surfaces of the interacting elements (some are kinematically connected to the wheels, others to the fixed elements of the chassis), braking moments occur due to friction braking mechanisms. Disc and drum brakes are the most common brake mechanisms of modern cars. The functions of the anti-lock braking system are to maintain controllability during emergency braking. In the best case, the car slides straight, in the worst one — an uncontrolled trajectory with unpredictable consequences. The latest anti-lock braking system is a complex electronic braking design, the basis for other systems: traction control, electronic stability control, assistance ones in case of emergency braking. The question of studying the operation of ABS is relevant and common while forensic examination of motor vehicles.

The Case Notes section finalizes research by **Serhii Naumenko** (Ukraine), **Viktoriia Symonenko** (Ukraine) and **Taras Taranets** (Ukraine) on the topic: *Compliance Determination of Real Estate Objects with Requirements of Legal Regulations in Construction Field* is completed. Attention is focused on the need for experts to apply an algorithm to solve such issues in accordance with the methods developed by specialists of State specialized institutions. The definition of unauthorized and capital construction of real estate is given. The ways of acceptance of unauthorized construction objects into operation in compliance with

requirements of regulatory legal acts in the field of construction have been worked out and set out.

Traditionally, the *Theory and Practice of Forensic Science and Criminalistics* research paper collection contains *News of scientific life*, column highlighting information about influential scientific events and research. The editorial board of *Theory and*

Practice of Forensic Science and Criminalistics research paper collection expresses its sincere gratitude to the authors who provided content for publication, as well as to the specialists who participated in its preparation for publication and invites all interested to submit their manuscripts in the next issues.

Together we will win! Glory to Ukraine!

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Current Issues of Criminalistics in Context of War and Global Threats

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Current issues of criminalistics in the conditions of martial law and global threats of the 21st century were studied. The main trends in formation and development of forensic science in current realities are defined and analyzed, and promising directions of its scientific research are outlined. Emergence and formation of new areas of criminalistics due to scientific and technological progress, introduction of the latest technologies, the need to detect specific traces and collect evidence (genomic, digital, nuclear, etc.) are substantiated. It is noted that it is important to take into account modern trends in development of criminalistics related to the formation of its separate branches (directions): medical, genotyping, computer (digital), aerospace and nuclear. In war conditions in Ukraine, formation of a new scientific direction of military forensics, its object, subject, system and tasks are defined. Issues of formation and development of European criminalistics, integration of Ukrainian criminalistics into the single European forensic space, development and implementation of innovative products into law enforcement practice, taking into account positive international experience in the field of combating crime, were analyzed. Rebooting and modernizing current paradigm have been proven to be promising. Expansion of application limits of forensic knowledge, necessary not only during the investigation

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of criminal offenses and/or trial in criminal proceedings, but also in various spheres of legal activity (administrative, civil, economic, arbitration proceedings and even in constitutional jurisprudence) is considered and substantiated.

Keywords: *forensic knowledge; new fields of forensic science; military forensic science; digital forensic science; nuclear forensic science; counteraction to crime; tasks of forensic science; forensic examination.*

Research Problem Formulation

Military aggression of the Russian Federation and introduction of martial law in Ukraine have significantly affected all spheres of our life. On the territory of Ukraine, Russian military massacres civilians, destroys infrastructure and homes of citizens, rapes women and children, looting, etc. The crimes committed by the military of the Russian Federation on the territory of our state are extremely large-scale, and their recording and investigation require a study of a significant volume of events, careful collection of a significant array of evidence and numerous forensic examinations. In such conditions, the legal science and the legal system faced new challenges and tasks, which, for their part, involve the use of new approaches to solve them¹. Thereby the tendency to strengthen the practical orientation of forensic

developments and innovative products, their pragmatic orientation to solving practical tasks in conditions of war and global threats is gaining special relevance².

Forensic science as an applied science, integrating modern achievements of science and technology, now directs its scientific potential to create an effective system of forensic tools, methods and technologies, which use is designed to solve complex practical tasks, among which possibility of applying forensic knowledge in the fight against crime becomes especially important in current realities of war, as well as the approach to a single forensic European space³. In such conditions, criminology is called upon to develop modern means, techniques and methods aimed at countering criminal offenses related to the military aggression of the Russian Federation against Ukraine and other crimes in wartime conditions.

- 1 Шепітько В. Теоретико-методологічна модель криміналістики та її нові напрями. Теорія та практика судової експертизи і криміналістики. 2021. Вип. 3 (25). С. 9–20. DOI: [10.32353/khrife.3.2021.02](https://doi.org/10.32353/khrife.3.2021.02) (date accessed: 26.09.2022) ; Konovalova V. O., Shevchuk V. M. Modern criminalistics in the conditions of war: problems of adaptation and reload. *Modern research in world science: Proceedings of the 5th International scientific and practical conference* (August 7–9, 2022). SPC-Sci-conf.com.ua. Lviv, Ukraine. 2022. Pp. 896–903. URL: <https://sci-conf.com.ua/v-mizhnarodna-naukovo-praktichna-konferentsiya-modern-research-in-world-science-7-9-08-2022-lviv-ukrayina-arhiv/> (date accessed: 26.09.2022) та ін.
- 2 Шевчук В. М. Криміналістична інноватика: поняття, функції, завдання та перспективи досліджень. *Теорія та практика судової експертизи і криміналістики*. 2020. Вип. 22. С. 20–40. DOI: [10.32353/khrife.2.2020.01](https://doi.org/10.32353/khrife.2.2020.01) (date accessed: 26.09.2022).
- 3 Журавель В. А., Шепітько В. Ю. Розвиток криміналістики та судової експертизи в Україні: наближення до єдиного європейського простору. *Правова наука України: сучасний стан, виклики та перспективи розвитку* : монографія. Харків, 2021. С. 631–669.

At the same time, the specifics of the formation and application of forensic knowledge reflect certain trends of modern globalized world development, existing challenges, threats and means of their elimination or neutralization. In connection with this, in modern realities, the question of increasing the role of forensics in the formation of evidentiary information and solving a number of other important forensic tasks of modern legal practice in the conditions of war and global threats of the 21st century is acute.

Analysis of Essential Researches and Publications

Scientific basis of the research was the work of forensic scientists, dedicated to the actual problems and development of innovative directions for the development of forensic science in the conditions of martial law and global threats, solution of some of its debating issues related to the problems of

increasing the efficiency and optimization of the activities of pre-trial investigation bodies, among which we can distinguish research papers: V. V. Bilous ⁴; P. D. Bilenchuk, V. P. Kolonyuk and A. A. Yarmolyuk ⁵; V. A. Zhuravel and V. Yu. Shepitko ⁶; I. I. Kogutich ⁷; V. O. Konovalova ⁸ et al.

At the same time, in current realities, the mentioned researches raised a number of debatable issues on conceptual basis of optimization of investigative activity by applying innovative approaches in solving the tasks of criminal justice in conditions of martial law and global threats and introducing their provisions and recommendations into law enforcement practice. The analysis of the specialized literature indicates that authors of only some research papers tried to investigate this issue, addressing specific issues of the application of the latest methods of increasing the effectiveness of criminal justice bodies in the conditions of martial law (I. V. Hloviuk ⁹, O. M. Dufeniuk ¹⁰,

- 4 Білоус В. В. Актуальні криміналістичні рекомендації із застосування технічних засобів для фіксування шкоди, завданої Україні внаслідок збройної агресії Російської Федерації. *Проблематика документального оформлення, визначення шкоди та відшкодування збитків, завданих Україні та її громадянам внаслідок збройної агресії Російської Федерації* : наук.-практ. конф. (Харків, 22.06.2022). Харків, 2022. С. 47–54. URL: <https://library.nlu.edu.ua/BIBLIOTEKA/SAIT/PDO-2022.pdf> (date accessed: 26.09.2022).
- 5 Біленчук П. Д., Колонюк В. П., Ярмолюк А. А. Криміналістика третього тисячоліття: освіта, наука, практика. *Криміналістика и судебная экспертиза*. 2015. Вип. 60. С. 112.
- 6 Журавель В. А., Шепітько В. Ю. *Op. cit.*
- 7 Когутич І. І. Про окремі виклики криміналістиці та шляхи її усталення. *Криміналістика і судова експертиза*. 2020. Вип. 65. С. 5–19. DOI: [10.33994/kndise.2020.65.01](https://doi.org/10.33994/kndise.2020.65.01) (date accessed: 26.09.2022).
- 8 Konovalova V. O., Shevchuk V. M. Prospective directions of research of innovations of separate criminalistic methodics. *Scientific practice: modern and classical research methods* : Collection of scientific papers «ΛΟΓΟΣ». Boston ; Vinnitsa, 2021. Vol. 1. Pp. 81–85. DOI: [10.36074/logos-26.02.2021.v1.23](https://doi.org/10.36074/logos-26.02.2021.v1.23) (date accessed: 26.09.2022).
- 9 Серкевич І., Устрицька Н., Навроцька В. та ін. Сучасні тенденції розвитку кримінальної юстиції в Україні : кол. моногр. ; за ред.: І. Гловюк, Н. Лашук. Львів, 2021. 388 с. URL: <http://dspace.lvduvs.edu.ua/handle/1234567890/3725> (date accessed: 26.09.2022).
- 10 Дуфенюк О. М. Розслідування воєнних злочинів: логістичні, криміналістичні та судово-медичні питання. *Юридичний науковий електронний журнал*. 2022. Вип. 4. С. 369–374. DOI: [10.32782/2524-0374/2022-4/88](https://doi.org/10.32782/2524-0374/2022-4/88) (date accessed: 26.09.2022).

O. V. Kaplina ¹¹, M. I. Pashkovskiy ¹², H. K. Teteriatnyk ¹³ and others). Therefore, in our opinion, the problem of scientific understanding of modern problems of criminology in the conditions of martial law and global threats requires special and deep study, analysis and further scientific developments. We see that such studies should be based on system-structural, technological, activity, and functional approaches and act as a methodological basis for studying and analyzing trends in the development of forensic knowledge and updating the current paradigm of forensics with the aim of harmonizing them with modern practical needs and realities of wartime.

Article Purpose

Study the current problems of criminalistics in modern conditions of martial law and global threats of the 21st century, to identify and subject to careful analysis the main trends and directions of its scientific researches.

Research Methods

At the theoretical level, the convergence from abstract to concrete, axiomatic,

system-structural and other methods of scientific research were used.

Main Content Presentation

In current realities, one of the most important tasks of forensics is the development and application of technical, tactical, and methodical forensic tools, techniques, and recommendations that make it possible to collect, investigate, and use evidentiary information. Evidence and proof are known to be the foundation of any legal process. The effectiveness of criminal proceedings in court and the speed of achieving the goal of justice depend on the quality and completeness of the evidence base collected while pre-trial investigation ¹⁴. In conditions of full-scale military aggression by Russian Federation on the territory of Ukraine, taking into account the modern tasks of adapting forensic knowledge to the conditions of martial law and reforming domestic legislation in accordance with the international standards of the European Union, issue of adapting and modernizing the forensic tasks to modern practical needs and development has become urgent. solving extremely complex tasks that have arisen before forensic science

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- 11 Капліна О. В. Відшкодування шкоди, завданої громадянинуві внаслідок збройної агресії РФ: кримінальний процесуальний аспект. *Проблематика документального оформлення ...*. С. 12–17. URL: <https://library.nlu.edu.ua/BIBLIOTEKA/SAIT/PDO-2022.pdf> (date accessed: 12.09.2022).
 - 12 Пашковський М. І. Про колізію інституту обміну військовополонених та інших осіб під час збройного конфлікту з зобов'язаннями кримінального переслідування і покарання осіб, винних у вчиненні міжнародних злочинів. *Актуальні проблеми приватного та публічного права* : мат-ли IV Міжнар. наук.-практ. конф., присвяч. 93-річ. з дня народж. чл.-кор. НАПрН України, акад. Міжнар. кадр. акад., засл. діяча науки України, д-ра юрид. наук, проф. Процевського О. І. (Харків, 21.05.2022). Харків, 2022. С. 443–447.
 - 13 Тетерятник Г. К. Кримінальне провадження в умовах надзвичайних правових режимів: теоретико-методологічні та праксеологічні основи : монографія. Одеса, 2021. 500 с.
 - 14 Шепітько В. Ю. Цільове призначення криміналістичних знань і прагнення до європейських стандартів у протидії злочинності. *Теорія та практика судової експертизи і криміналістики*. 2017. Вип. 17. С. 5–12. URL: http://nbuv.gov.ua/UJRN/Tpsek_2017_17_5 (date accessed: 26.09.2022).

and criminal justice bodies. Even in such difficult conditions, criminology must develop the latest means, techniques and methods aimed at countering crimes related to the military aggression of the Russian Federation against Ukraine and other criminal manifestations in war conditions.

According to the official statistics of the Office of the Prosecutor General, among the crimes committed during the period of the full-scale invasion of the Russian Federation, the following are the most common (as of September 9, 2022): a) crimes of aggression and war crimes – 32,678; b) crimes against national security – 15,256; c) crimes against children (not including information from places of active hostilities) – 383 children died, 743 children were injured; 4) the magisterial case regarding the aggression of the Russian Federation – 624 suspected representatives of the military and political leadership of the Russian Federation (military command, officials, ministers, deputies, heads of law enforcement agencies, etc.)¹⁵. Transformation of crime in Ukraine during the war had a significant impact on changing the priorities of the tasks of forensics and the specifics of the formation and application of forensic knowledge in the conditions of martial law. The leading tasks of criminology remain the development and application of tools, techniques and methods that allow collecting, researching and using evidentiary information even in the difficult conditions of war and current global threats.

Practice analysis of investigating criminal offenses of these categories shows that investigative bodies and operational

units face serious difficulties in their detection, disclosure and investigation, especially in conditions of martial law and hostilities. First of all, this is related to the specifics of the methods of committing such criminal offenses and their consequences, the available traces, the characteristics of the criminal identity, and the insufficiency of the use of scientific and technical, tactical means and special knowledge for their effective detection and investigation. In addition, we also consider the procedure of pre-trial investigation and trial, the process of gathering evidence under martial law to be complicated. Therefore, the question of increasing the role of forensics in forming the evidence base for the investigation of war crimes committed by the Russian military in Ukraine is acute.

A rather interesting example from the history of forensic science regarding the collection of evidence in the difficult conditions of war is the activities of the famous German and Swiss forensic scientist, professor, doctor of chemical sciences *Rudolphe Archibald Reiss* (1875–1929). In 1914, he arrived in Serbia at the invitation of the government of that country as an expert to investigate the crimes of the Austro-Hungarian, German and Bulgarian armies in the First World War. Therefore, two of his works (peculiar reports, conclusions and reports) are of some scientific and practical interest – a special forensic study of the facts that took place during the First World War, which became the basis for condemnation of the actions of the Austro-Hungarian, German and Bulgarian armies. These documents are illustrated by photographs, witness statements and expert evidence. 1916 in London (Great Britain) R. A. Reiss

15 Офіс Генерального прокурора задокументував 47 934 злочини проти України / АрміяINFORM : інформагентство Міноборони України. URL: <https://armyinform.com.ua/2022/09/09/ofis-generalnogo-prokurora-zadokumentuvav-47-934-zlochyny-proty-ukrayiny/> (date accessed: 12.09.2022).

published *Report Upon Atrocities Committed by the Austro-Hungarian Army During the First Invasion of Serbia* ¹⁶ Two years later, another of his papers, dedicated to the events of the First World War, was published in Paris (France): *Les Infractions aux Lois et Conventions de la Guerre Commises par les Ennemis de la Serbie Depuis la Retraite Serbe de 1915: Résumé de l'Enquête Exécutée sur le Front de Macédoine* ¹⁷. The materials collected by R. A. Reiss contributed to the condemnation of crimes committed during this war¹⁸. We see that in modern realities, the practice of applying forensic knowledge to gather evidentiary information during war is quite relevant and important.

Currently, in martial law conditions, tendency to strengthen practical orientation of forensic developments and innovative products, their pragmatic orientation to solving specific tasks, is of particular importance. It is no coincidence that at one time (before the events of the First World War), the founder of criminology, the Austrian lawyer Hans Gross, called the practical goal of criminology an immutable goal ¹⁹. Therefore, criminalistics in general and each of its sections in particular face tasks related to ensuring the activities of law enforcement agencies and other

special subjects, which with the help of effective criminological recommendations will combat crime in martial law conditions (in particular, with regard to the detection, documentation and investigation of crimes, related to the military aggression of the Russian Federation against Ukraine).

Depending on theoretical and applied issues, currently the tasks of criminology can be combined into two levels aimed at improving: a) the theory of criminology; b) law enforcement practice (we are talking about both scientific and practical developments for the development of the theory of criminology, and the solution of problems for the practice of law enforcement) ²⁰. We see these and other important tasks can be solved comprehensively and systematically, in particular by improving criminal and criminal procedural legislation and developing theoretical and methodological foundations and scientific and practical recommendations for the investigation of this category of criminal offenses²¹. In the context of the war and the realization of Ukraine's aspirations to become a full member of the European Union, certain changes are taking place. In war conditions and realization of Ukrainian aspirations

16 Reiss R. A. Report upon atrocities committed by the Austro-Hungarian army during the First invasion of Serbia. London, 1916. 192 p.

17 Ibidem. *Les Infractions aux Lois et Conventions de la Guerre Commises par les Ennemis de la Serbie Depuis la Retraite Serbe de 1915: Résumé de l'Enquête Exécutée sur le Front de Macédoine*. Paris, 1918. 332 pp.

18 Шепитько М. В. Рудольф Арчибальд Рейсс. *Криміналіст першодрукований*. 2015. № 10. С. 111–112 ; Шепитько В. Ю. Криміналістика як система наукових знань в умовах глобальних загроз і трансформації злочинності. *Теорія та практика судової експертизи і криміналістики*. 2018. Вип. 18. С. 7. DOI: [10.32353/khrife.2018.01](https://doi.org/10.32353/khrife.2018.01) (date accessed: 26.09.2022).

19 Gross H. *Gesammelte Kriminalistische Aufsätze*. Leipzig, 1902. P. VIII. 432 p. URL: https://archive.org/stream/bub_gb_XPAqAAAAMAAJ/bub_gb_XPAqAAAAMAAJ_djvu.txt (date accessed: 26.09.2022).

20 Шепитько В. Ю. Криміналістика як система С. 4–9. DOI: [10.32353/khrife.2018.01](https://doi.org/10.32353/khrife.2018.01) (date accessed: 26.09.2022).

21 Журавель В. А. *Загальна теорія криміналістики: генеза та сучасний стан : монографія*. Харків, 2021. С. 6–7.

to become a full member of the European Union, certain changes are taking place (modernization and a kind of reboot of criminology, connected primarily with the emergence of new challenges to society and the need to solve primary tasks in conditions of active hostilities; the formation of criminological knowledge in accordance with the needs of practice in the realities of wartime and global upheavals), because the change in forensic paradigms affects the entire system of forensic knowledge.

Forensic science as an applied science, integrating modern achievements of science and technology, now directs its scientific potential to create an effective system of forensic tools, methods and technologies, which use is designed to solve complex practical tasks, among which possibility of applying forensic knowledge in the fight against crime becomes especially important in the realities of current military and the approach to a single forensic European space²². Ukrainian integration into the world and European community requires adapting national legislation to international standards and obligations. This especially applies to criminalistics and criminal procedure, both in the field of combating crime and in the field of protecting important constitutional rights, freedoms and interests of citizens, taking into account the realities of the development of Ukrainian society.

As V. Yu. Shepitko rightly notes, today there is a change in the vector of forensic

research in Ukraine, its approach to the single European space²³. Therefore, *Ukraine*, which has determined the course of accession to the EU as one of the priority areas of activity, faces the task of bringing national legislation in line with European standards (in particular, in the field of counteraction to crime, the implementation of justice, the formation and development of the military justice system)²⁴. The solution of this issue requires appropriate legislative regulation and the development of a *concept of forensic support for the activities of military justice bodies*, which determines a new scientific direction of research in forensic science²⁵. Therefore, the question of the formation and development of European criminology and the integration of criminological knowledge into a single European criminological space is relevant.

Further prospects for the formation and development of forensic doctrine involve rebooting and modernizing the current paradigm of forensic science. First of all, it is about actualizing and taking into account the positions of many forensic scientists (among whom I. I. Kohutych, V. H. Lukashevych, V. M. Stratonov, V. Yu. Shepitko, etc.), in particular, V. H. Honcharenko's proposals that knowledge offered by forensic science can be successfully adapted and widely applied not only for criminal judicial, but for any other activity related to obtaining and analyzing legally significant information, that is, in constitutional, civil, economic

22 Журавель В. А., Шепітько В. Ю. *Op. cit.*

23 Шепітько В. Теоретико-методологічна модель криміналістики DOI: 10.32353/khrife.3.2021.02 (date accessed: 26.09.2022).

24 Богущкий П. П. Військова юстиція як правова система: міжнародні стандарти та національні особливості. *Діяльність військової юстиції в умовах збройного конфлікту. Досвід української прокуратури* : мат-ли Міжнар. наук.-практ. конф. (Харків, 28.10.2021). Київ ; Одеса, 2021. С. 19–26.

25 Шевчук В. М. Перезавантаження криміналістики в умовах війни: проблеми, завдання, перспективи. *Проблематика документального оформлення ...* . С. 46. URL: <https://library.nlu.edu.ua/BIBLIOTEKA/SAIT/PDO-2022.pdf> (date accessed: 26.09.2022).

and administrative processes, etc ²⁶. As I. I. Kohutyč notes:

“Criminalistics is objectivity science(regularity) of the mechanism of a criminal offense or other legal fact, the emergence of information about them, as well as about the collection, verification, evaluation and use of information obtained in this activity and specially developed means and methods of studying legally significant events.

Under such an approach, in the sense of criminology, its knowledge can and, if necessary, should be used both in the field of criminal jurisdiction and in other non-criminal jurisdictional areas, which will significantly increase the current demand for this science “²⁷.

The field of forensic science is expanding and penetrating into new fields of knowledge, turning into a cognitive tool that is increasingly used in various activities where it is necessary to learn the truth by examining various material or ideal traces and even other objects ²⁸. Methods and tools of forensics are used in civil, administrative processes and other areas of legal practice. Therefore, the proposals of scientists to supplement the traditional understanding of the structure of forensic science with a new section tentatively titled “Applied criminology in legal practice” which would be focused on the use of forensic capabilities in civil, arbitration and administrative processes, in other

spheres of legal activity of law enforcement, deserve attention ²⁹. In addition, as noted by Lithuanian criminologists, the role and importance of forensics is important not only in the investigation of criminal offenses in the work of law enforcement officers, in criminal proceedings, but also in administrative, civil, economic and arbitration proceedings and even in constitutional jurisprudence³⁰. Thus, issue of revising, modernizing and significantly updating the modern understanding of the subject of criminology and expanding the boundaries of the application of criminological knowledge in various areas of legal activity.

In war conditions and modern European integration processes, criminology is being rebooted, primarily associated with the emergence of new challenges to the criminal justice system and the need to solve primary tasks during active hostilities on the territory of Ukraine, to adapt criminological knowledge to the requirements of practice. In such conditions, criminalistics is called upon to develop the latest means, techniques and methods aimed at countering criminal offenses related to the military aggression of the Russian Federation against Ukraine and other related crimes. Separately, it is necessary to develop systems of forensic methods of investigation, to improve technical and forensic support, application of special knowledge, protection of

26 Даньшин М. В. Окремі методичні та психологічні аспекти викладання криміналістики. *Форум права*. 2013. Вип. 2. С. 110–115.

27 Когутіч І. І. *Op. cit.* С. 15. DOI: [10.33994/kndise.2020.65.01](https://doi.org/10.33994/kndise.2020.65.01) (date accessed: 26.09.2022).

28 Yaremchuk V. O. Some questions of the history of the formation of the system of criminalistic knowledge. *Problems of Legality*. 2021. Is. 155. P. 219. DOI: [10.21564/2414-990X.155.237590](https://doi.org/10.21564/2414-990X.155.237590) (date accessed: 26.09.2022).

29 Малевски Г., Курапка В. Э., Тамеле И. Мотивы и ожидания студентов – важный фактор в реализации новой бакалаврской программы «Право и криминалистика». *Криміналіст періодукованій*. 2021. № 21–22. С. 17.

30 Judzinskytė A. Lietuvos teisinės bendruomenės kriminalistinis švietimas. *Criminalistics Education of the Lithuanian Legal Community*. 2022. Pp. 90. URL: <https://vb.mruni.eu/object/eba-ba:117023592/> (date accessed: 12.11.2022).

information sources and information security. In fact, it can be stated: a new scientific forensic direction is being currently formed: *military forensics*³¹.

It is worth noting that in the history of criminology there were attempts to form the idea of *military field criminology* (for example, H. M. Hryhorian)³². In our opinion, the proposed terms somewhat narrow the understanding of the subject, system and tasks of military forensics. So, for example, the very term “field forensics” is debatable, since it rather conventionally means technical forensic tools and methods of working with evidence that are used or can be used not in the investigator’s office or in the expert’s laboratory, but directly at the scene of the incident during its inspection, or during the conduct of other investigative actions or research expert operations at this place. As we can see, these questions are far from exhausting the problems of military forensics. Analysis and solution of other problems that require research in this specific field of knowledge are of considerable interest both from a scientific and a practical point of view.

We believe that the *content* of scientific concept of military forensics should consist of ideas and theoretical propositions about the object of research, knowledge system, the content of its individual elements, the place in the system of scientific knowledge, the significance for the theory and practice of investigative work, the tasks of further scientific research. Research *object* of military forensics is

the regularities of collecting, researching and using evidentiary information for the investigation of crimes occurring in areas of armed conflict and active hostilities. The object of military criminalistics is to a certain extent determined by its *system* containing scientifically based and practically tested forensic regulations and recommendations on the organization of detection, documentation and investigation of crimes committed in areas of active hostilities or armed conflict. Also, the provisions of this system stipulate the development and use of theoretical and methodological foundations, the selection and application of means, methods and techniques of forensic techniques, tactics and methods of crime investigation, taking into account specific conditions of activity (martial law or active hostilities). The main *tasks* of military forensics are the development, formation and application of a system of means, methods, techniques and measures of forensic security against the commission of relevant criminal offenses. Since military forensics has a complex nature, it should cover theoretical-methodological, technical-forensic, tactical-organizational and methodological forensic research areas.

Theoretical and methodological foundations of military forensic science contain general scientific issues related to the development of the concept, subject, system and tasks of military forensic science, its place in the system of forensic science. Important areas of scientific

31 Shevchuk V. The role of criminalistics in improving the efficiency of the investigation of war crimes committed by the military of the RF in Ukraine. *Scientific Collection «InterConf»*. 2022. Vol. 122. Pp. 187–195. URL: <https://archive.interconf.center/index.php/conference-proceeding/article/view/1208> (date accessed: 26.09.2022).

32 Григорян Г. М. Международно-правовые и организационные основы расследования военных преступлений, совершаемых противоборствующими сторонами вооруженного конфликта : автореф. дис. ... д-ра юрид. наук. Ереван, 2021. 41 с. URL: https://rau.am/uploads/post/editor_image/%20%D0%93%D1%80%D0%B8%D0%B3%D0%BE%D1%80%D1%8F%D0%BD_1620670582.pdf (date accessed: 26.09.2022).

research can be the development of such scientific problems as the methodology of military forensics, the system of the course of military forensics, innovations in forensic didactics during the teaching of military forensics, etc. In this case, we can talk about war forensics as a new scientific direction in forensic doctrine, which has significant prospects and requires further scientific researches.

In the direction of *technical and forensic support* of military forensics, scientific developments and research on the creation and implementation of innovative forensic products aimed at optimizing the fight against crime in the military sphere, documenting and investigating detected crimes related to the military aggression of the Russian Federation against Ukraine should be updated. Among such innovative products can be named the latest (newly created or adapted to the tasks and needs of countering war crimes and other criminal detection in wartime) technical and forensic tools, modern information technologies, electronic knowledge bases, methods of recording, analyzing, evaluating and collecting evidentiary information. In addition, for the needs of military forensics, it is possible to apply modern biometric identification systems based on human characteristics (fingerprints, appearance features, iris pattern, DNA, features of gait or handwriting, etc.). It is relevant to use the capabilities of unmanned aerial vehicles, surveillance and video surveillance systems, electronic monitoring of the movement of people in space and air, identification systems for recognizing people by faces, etc. It is necessary to intensify the work on the application of artificial intelligence to

support the considered types of activities and to solve practical tasks both in the field of law enforcement and in the fight against crime in war conditions.

In the *tactical and organizational support* of military forensics, the development of tactical bases for conducting procedural actions and forensic recommendations for their conduct in the conditions of war should be promising areas of research. They may be related to the specifics of the tactics of conducting individual investigative (search) and covert investigative (search) actions under martial law or hostilities. This situation necessitates the development of new tactical techniques, a review of the capabilities of tactical combinations and tactical operations, algorithms of investigative (search) actions, etc. It is important to develop separate tactics for conducting actions in which participants (suspects, witnesses, victims, etc.) are persons from temporarily occupied territories or from areas of active hostilities, as well as prisoners of war.

Forensic support of military criminalistics is closely related to the change in criminal and criminal procedural legislation, since such changes require the improvement of existing methods of investigating criminal offenses and the development of new forensic methods³³. Innovative developments in this field of forensic science should be aimed at creating methods for investigating new types of criminal offenses, tactical operations, algorithms of investigative (search) actions, checking typical investigative versions, developing forensic characteristics of criminal offenses, etc.³⁴ Realities of the war in Ukraine require urgent improvement, development and

33 Чорноус Ю. М. Криміналістичне забезпечення розслідування злочинів : монографія. Вінниця, 2017. 492 с.

34 Konovalova V. O., Shevchuk V. M. Op. cit. DOI: [10.36074/logos-26.02.2021.v1.23](https://doi.org/10.36074/logos-26.02.2021.v1.23) (date accessed: 26.09.2022)

implementation in practice of a system of forensic methods for the investigation of certain types of crimes committed by military personnel in areas of armed conflict (in particular, investigations of voluntary abandonment of a military unit (place of service) and desertion; evasion of military service by mutilation; crimes, committed by military personnel against the civilian population; embezzlement of weapons and ammunition by military personnel; excess of official authority by commanders of military units, etc.).

In addition, scientific research methods of investigating crimes against the foundations of national security of Ukraine; war crimes committed by the military of the Russian Federation in Ukraine; crimes against peace, human security and international law and order; crimes related to the illegal use of humanitarian assistance, charitable donations or free assistance, illegal crossing of the state border of Ukraine, etc. are becoming relevant. Dissemination of information computer technologies contributes to the further development of algorithmizing of the pre-trial investigation process and ensuring the efficiency and effectiveness of legal proceedings.

Today, significant changes are taking place in the forensic security of law enforcement agencies, connected with the processes of informatization of society and the introduction of innovative

approaches that use modern information, digital, telecommunication and other technologies. Therefore, we can assert the emergence of a new direction in forensic science, namely: *digital forensics (Digital Criminalistics)*³⁵, the development and implementation of which we see as quite promising for the development of forensic knowledge and forensic expert activity³⁶. Therefore, it is important to take into account the modern trends in the development of forensics related to the formation of its separate branches (directions): medical, genotyping, computer (digital), aerospace and nuclear. The formation of new areas of criminology is due to scientific and technical progress, the introduction of the latest technologies, the need to detect specific traces and collect evidence (genomic, digital, nuclear, etc.)³⁷.

In view of the above, there is a need to introduce innovative technologies into the educational process, which will help prepare highly qualified, competitive lawyers at the European level. The mentioned trends in development of criminology pose new challenges to the legal education system and criminology as a scientific and applied legal science at the forefront of the fight against crime. Therefore, the issue of formation and application of innovative approaches in forensic training and education is acute. V. Yu. Shepitko rightly points out that in

35 Shepitko V. The Formation of Digital Criminalistics as a Strategic Direction for the Development of Science. 17 *Medzinarodny Kongres Kriminalistika a Forenzne Vedy: Veda, Vzdelavanie, Prax*. Zbornik Prispievkov. Bratislava, 2021. Pp. 185–196. URL: https://www.akademia.pz.sk/sites/default/files/KKFV/2020/CrimCongres2021_zbornik_draft_digit_v6_202107.pdf (date accessed: 26.09.2022).

36 Shevchuk V. Modern problems of formation and prospects for researching the concept of criminalistic innovation. *Tendances scientifiques de la recherche fondamentale et appliquée: collection de papiers scientifiques «ΛΟΓΟΣ»*. Strasbourg, 2020. Vol. 2. Pp. 67–72. DOI: 10.36074/30.10.2020.v2.20 (date accessed: 26.09.2022).

37 Шепітько В. Теоретико-методологічна модель криміналістики DOI: 10.32353/khrife.3.2021.02 (date accessed: 26.09.2022).

modern conditions in Ukraine, significant attention should be paid to the problems of forensic didactics³⁸.

For a comprehensive study of the issues of methods improving of teaching criminalistics and the specifics of forensic training of future lawyers, students and cadets, it is necessary to clearly answer the following questions: 1) what to teach (content of education?); 2) how to teach (forms, methods, organization of training?); 3) whom to teach?; 4) Who will teach?³⁹. At the same time, the content of forensic training and education, as well as forensic didactics, should be considered through the prism of the subject of forensics and trends in its development. Forensic didactics examines the regularities of acquiring forensic knowledge, acquiring skills and skills in forensics and, in turn, determines the scope, content and structure of a forensics training course⁴⁰.

Taking into account current tasks of adapting forensic knowledge to the conditions of martial law and reforming domestic legislation to the international standards of the European Union, the problems of adapting and modernizing

forensic knowledge to modern requirements of practice are quite relevant⁴¹. Therefore, we consider the following to be the most promising areas of innovative scientific research in forensics: documentation and investigation of war crimes committed by the Russian military in Ukraine; search for missing Ukrainians and identification of those killed in the war in Ukraine; the use of digital forensics to identify, record and investigate war crimes committed by the Russian military in Ukraine; activation of the application of special knowledge and the conduct of forensic expert studies to determine the amount of damages suffered by individuals and legal entities as a result of Russian armed aggression; development and application of innovative forensic products to improve the effectiveness of war crimes investigations; forensic support for the activities of the International Criminal Court⁴²; construction and application of an appropriate system of separate forensic methods of war crimes and other criminal offenses related to the military aggression of the Russian Federation against Ukraine⁴³, etc. The above-mentioned problems should be taken into account during

38 Ibidem. Формування криміналістики та криміналістичної дидактики в Україні. *Теорія та практика судової експертизи і криміналістики*. 2020. Вип. 22. С. 7–19. DOI: [10.32353/khrife.2.2020.01](https://doi.org/10.32353/khrife.2.2020.01) (date accessed: 26.09.2022).

39 Маннс Г. Ю. Криминалистика, как прикладная дисциплина и предмет преподавания. *Сборник трудов профессоров и преподавателей Государственного Иркутского Университета*. Отдел I – науки гуманитарные. 1921. Вып. 2. С. 139–164.

40 Шепітько В. Ю. Дидактика криміналістична. *Велика українська юридична енциклопедія: у 20 т. ; ред. кол.: В. Я. Тацій та ін. Т. 20: Криміналістика, судова експертиза, юридична психологія ; редкол.: В. Ю. Шепітько (голова) та ін. Харків, 2018. С. 361.*

41 Ackermann V. R., Kurapka V. E., Malewski H., Shepitko V. Schaffung eines einheitlichen europaischen Kriminallistischen Raumes: Die Tatigkeit offentlicher Organisationen zur Starkung der internationalen Beziehungen. *Kriminalistik*. 2020. Is. 6. Pp. 355–363.

42 Shevchuk V. Problems of criminalistic support of the practice of the International Criminal Court in Ukraine. *Do desenvolvimento mundial como resultado de realizações em ciência e investigação científica: Coleção de trabalhos científicos «ΛΟΓΟΣ»*. Lisboa, 2020. Vol. 4. Pp. 14–19. DOI: [10.36074/09.10.2020.v4.03](https://doi.org/10.36074/09.10.2020.v4.03) (date accessed: 26.09.2022).

43 Дуфенюк О. М. Розслідування воєнних злочинів в Україні: виклики, стандарти, інновації. *Baltic Journal of Legal and Social Sciences*. 2022. № 1. С. 46–56. DOI: [10.30525/2592-8813-2022-1-6](https://doi.org/10.30525/2592-8813-2022-1-6) (date accessed: 26.09.2022).

the formation of programs, educational disciplines and improvement of the methodology of teaching forensic science and the formation of forensic didactics in the conditions of war, global threats and European integration processes.

Conclusions

Thus, in current realities and in wartime, in view of the transformation of crime and European integration processes in the state, forensics faces new challenges: the paradigm of forensic doctrine is changing, which affects the peculiarities of the formation and application of the forensic knowledge system, and this requires qualitatively new, innovative approaches to ensure effective mastery of forensic knowledge, skills and abilities by both future lawyers and experienced specialists. In particular, we are talking about the development and introduction of modern educational technologies, improving the content and methods of teaching criminalistics, which successfully solves new problems and counteracts modern challenges in the conditions of war and global threats of the 21st century, taking urgent measures for their neutralization.

Forensic education and forensic training of future lawyers acquire special importance and relevance in such a situation, which should take into account modern trends and tasks, adapt forensic knowledge to the conditions of martial law, reform domestic legislation to the standards of the European Union and the emergence of new branches (directions) of criminalistics. At the same time, the practical component of the teaching of criminology is being strengthened and activated: it is important to take into account the current trends in its development associated with the formation of new areas (digital, medical, aerospace, DNA profiling,

computer, cyber security, nuclear and military), in order to significantly increase the role and the applied value of the application of forensic knowledge in the realities of wartime and global threats to world civilization.

Сучасні проблеми криміналістики в умовах війни та глобальних загроз Віктор Шевчук

Досліджено актуальні проблеми криміналістики в умовах воєнного стану та глобальних загроз ХХІ ст. Визначено та проаналізовано основні тенденції формування та розвитку криміналістичної науки в реаліях сьогодення й окреслено перспективні напрями її наукових досліджень. Обґрунтовано появу та формування нових напрямів криміналістики, обумовлених науково-технічним прогресом, запровадженням новітніх технологій, необхідністю виявляти специфічні сліди і збирати докази (геномні, цифрові, ядерні тощо). Зазначено, що важливо враховувати сучасні тенденції розвитку криміналістики, пов'язані з формуванням її окремих галузей (напрямів): медичної, генотипоскопічної, комп'ютерної (цифрової), аерокосмічної та ядерної. В умовах війни в Україні актуальним є формування нового наукового напрямку воєнної криміналістики, визначено її об'єкт, предмет, систему та завдання. Проаналізовано проблеми формування й розвитку європейської криміналістики, питання інтеграції української криміналістики в єдиний європейський криміналістичний простір, розроблення та впровадження у правозастосовну практику інноваційних продуктів з урахуванням позитивного міжнародного досвіду у сфері протидії злочинності. Доведено, що перспективними є перезавантаження та модернізація чинної парадигми. Розглянуто й обґрунтовано розширення меж застосування криміналістичних знань,

необхідних не лише під час розслідування кримінальних правопорушень і/або судового розгляду в кримінальному судочинстві, а й у різних сферах юридичної діяльності (адміністративному, цивільному, господарському, арбітражному судочинстві й навіть у конституційній юриспруденції).

Ключові слова: криміналістичні знання; нові галузі криміналістики; воєнна криміналістика; цифрова криміналістика; ядерна криміналістика; протидія злочинності; завдання криміналістики; судова експертиза.

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The Role of Leadership Style in Asset Misappropriation: An Ethnography Study

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This study is an ethnography study conducted in a private construction company in the oil and gas sector. The study aims to uncover the socio-cultural reasons behind employee asset misappropriation in an organization. Asset misappropriation is a scheme of occupational fraud that often occurs repeatedly. ACFE in 2022 stated that this scheme consistently ranks first, with the number of cases up to 86%. The main question of this research is how leadership style can shape organizational culture and become one of the triggers for the emergence of acts of asset misappropriation in an organization. Furthermore, this study concludes that leaders can shape and internalize organizational culture, and fraud as a social reality can be triggered by leadership styles. Aspects of the multi-paradigm that exist in accounting arise because accounting can be combined with other sciences, one of which is forensics. Forensics is a field of science designed to aid in the process of upholding justice through the process of applying science or science. What is learned from forensic accounting not only concerns how an organization becomes a victim of fraud or how the flow of company funds can be manipulated in this way, but forensic accounting also examines the behavior of fraudsters. The purpose is that in the future, organizations can find the right way to minimize the occurrence of fraud in their environment. From this, forensic accounting has become a collection of different disciplines, such as accounting, sociology, law, culture, criminology, computer science, and psychology.

Keywords: fraud; asset misappropriation; forensic accounting; organizational culture; social learning; leadership style.

Research Problem Formulation

Considering that asset misappropriation schemes are still the scheme with the most cases¹, the researcher wants to reveal what triggers the act of asset misappropriation. R. O. Dinata et al.² suggests that the culture of an area can shape and encourage someone to commit fraud. Culture always teaches good things, but is it true that culture can be a trigger for evil actions?

Moving on from this, the researcher intends to reveal further whether organizational culture is one of the triggers for the misappropriation of assets in the corporate environment, especially in the private sector how to comprehensively disclose asset misappropriation from a cultural perspective so that new knowledge can be obtained of the socio-cultural reasons that encourage someone to engage in asset misappropriation.

Analysis of Essential Researches and Publications

Most research on fraud is still around quantitative technical aspects, for example, the forexhibition of an internal control system in preventing fraud or the amount of loss experienced by a company, and tends to ignore the behavioral aspect³. A. Chariri⁴ argues that fraud is a social reality, in which

research with a qualitative approach is very helpful in uncovering fraud from a social perspective, not just nominal.

Article Purpose

The researcher is interested in conducting research with a qualitative approach, especially with the ethnographic method. These ideas arise because there is still little qualitative-based research on fraud, especially asset misappropriation; it is hoped that the findings from this research can enrich forensic accounting science.

Main Content Presentation

Introduction

Fraud is a phenomenon that various parties widely debate. The phenomenon of fraud is not only used by practitioners but also discussed by researchers. T. W. Singleton and A. J. Singleton⁵ state that fraud is a criminal act that describes all dishonest acts committed by someone to gain an advantage, either by silence, deceiving, or unfair ways to cheat others. One of the frauds that are often discussed in various forms of accounting is job fraud. Occupational fraud is a type of fraud committed by employees against the company⁶. ACFE noted that asset misappropriation was the most

- 1 Association of Certified Fraud Examiners (ACFE). *Report to the Nations on Occupational Fraud and Abuse*. 2010 ; ACFE. *Report To The Nations On Occupational Fraud And Abuse : Global Fraud Study*. 2012 ; ACFE. *Fraud Examiners Manual International Edition*. 2017 ; ACFE. *Global Study on Occupational Fraud and Abuse*. 2018 ; ACFE. *Report To The Nations — Global Study on Occupational Fraud and Abuse: Asia Pacific. Asia Pacific Edition*. 2018 ; ACFE. *2020 Report to the Nations*. 2020 ; ACFE. *Occupational Fraud 2022: A Report To The Nations*. 2022.
- 2 Dinata R. O., Irianto G., Mulawarman A. D. Revealing Cultural Causes of Fraud: An Ethnographic Study in Public Company. *Jurnal Economia*. 2018. Vol. 14. Is. 1. Pp. 66. DOI: 10.21831/economia.v14i1.18453 (date accessed: 09.09.2022).
- 3 Chariri A. *Sociology of Accounting: Social Reconstruction of Forensic Accounting in Fraud Eradication in Indonesia*. Semarang, 2019.
- 4 Chariri A. *Anti-Fraud Socio-Cultural Construction Using Local Wisdom*. Semarang, 2020.
- 5 Singleton T. W., Singleton A. J. *Fraud Auditing and Forensic Accounting*. 4th Ed. New Jersey, 2010.
- 6 ACFE. *Occupational Fraud ...*. 2022.

frequent mode of employee occupational fraud during the three survey periods. This asset misappropriation scheme ranks first, with 86% of cases worldwide. The survey shows that asset misappropriation is easy to repeat with its various method ⁷.

Individuals who misappropriate assets at work are usually caused by pressure, opportunity, and rationalization (fraud triangle) owned by individuals ⁸. Furthermore, E. Feess & Y. Tomofeyev prove that individuals who can misappropriate assets are due to financial difficulties. In addition to financial problems, individuals who misappropriate these assets are based on the rationalization that their actions were not wrong ⁹. Cases of misappropriation of assets have spread to various industrial sectors worldwide in the construction sector. Based on the Kroll Global Fraud and Risk Report 2019/2020, as many as 83% of construction company executives reported that their construction company was a victim of fraud. Then approximately 34% of construction company executives said

their company lost 7% of its revenue due to fraud. The construction sector is the second most prominent victim of all industries (besides retail), in line with the Kroll Global Fraud Report findings. A. P. C. Chan & E. K. Owusu ¹⁰ state that it is common knowledge that the construction sector is a green field for fraud perpetrators. The most common scheme in the construction sector is asset misappropriation with various modes.

J. P. Kennedy ¹¹, in his research, found that in the Midwestern United States, many employees from small businesses still misappropriate assets, such as stealing cash and filing false collections. Small business owners who are victims of the misuse of their employees' assets state that the emotional costs of employee theft are far greater than the financial costs ¹². Research conducted by E. H. Nia & J. Said ¹³ found that the cause of bank bankruptcy in Iran was because its employees misappropriated assets, such as applying for fictitious medical expenses, making new checkbook

- 7 Koomson T. A. A., Owusu G. M. Y., Bekoe R. A., Oquaye M. Determinants of asset misappropriation at the workplace: the moderating role of perceived strength of internal controls. *Journal of Financial Crime*. 2020. Vol. 27. Is. 2. DOI: [10.1108/JFC-04-2020-0067](https://doi.org/10.1108/JFC-04-2020-0067) (date accessed: 09.09.2022).
- 8 Feess E., Timofeyev Y. Behavioral red flags and loss sizes from asset misappropriation: Evidence from the us. *Advances in Accounting Behavioral Research*. 2020. Vol. 23. Pp. 77–117. DOI: [10.1108/S1475-14882020000023004](https://doi.org/10.1108/S1475-14882020000023004) (date accessed: 09.09.2022).
- 9 Kazemian S., Said J., Nia E. H., Vakilifard H. Examining fraud risk factors on asset misappropriation: evidence from the Iranian banking industry. *Journal of Financial Crime*. 2018. Vol. 26. Is. 2. DOI: [10.1108/JFC-01-2018-0008](https://doi.org/10.1108/JFC-01-2018-0008) (date accessed: 09.09.2022).
- 10 Chan A. P. C., Owusu E. K. Corruption Forms in the Construction Industry: Literature Review. *Journal of Construction Engineering and Management*. 2017. Vol. 143. Is. 8. Pp. 1–12. DOI: [10.1061/\(ASCE\)CO.1943-7862.0001353](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001353) (date accessed: 09.09.2022).
- 11 Kennedy J. P. Asset Misappropriation in Small Businesses. *Journal of Financial Crime*. 2018. Vol. 25. Is. 2. DOI: [10.1108/JFC-01-2017-0004](https://doi.org/10.1108/JFC-01-2017-0004) (date accessed: 09.09.2022).
- 12 Chen C. X., Sandino T. Can Wages Buy Honesty? The Relationship Between Relative Wages and Employee Theft. *Journal of Accounting Research*. 2012. Vol. 50. Is. 4. Pp. 967–1000. DOI: [10.1111/j.1475-679X.2012.00456.x](https://doi.org/10.1111/j.1475-679X.2012.00456.x) (date accessed: 09.09.2022) ; Gross-Schaefer A., Trigilio J., Negus J., Ro C.-S. Ethics education in the workplace: An effective tool to combat employee theft. *Journal of Business Ethics*. 2000. Vol. 26. Is. 2. Pp. 89–100. DOI: [10.1023/A:1006038310865](https://doi.org/10.1023/A:1006038310865) (date accessed: 09.09.2022).
- 13 Nia E. H., Said J. Assessing Fraud Risk Factors of Assets Misappropriation: Evidences from Iranian Banks. *Procedia Economics and Finance*. 2015. Vol. 31. Is. 15. Pp. 919–924. DOI: [10.1016/S2212-5671\(15\)01194-6](https://doi.org/10.1016/S2212-5671(15)01194-6) (date accessed: 09.09.2022).

submissions for personal or close relatives without authority, borrowing valuable assets such as foreign currency for personal use. Most research on fraud is still around quantitative technical aspects, for example, the forexhibition of an internal control system in preventing fraud or the amount of loss experienced by a company, and tends to ignore the behavioral aspect¹⁴.

The context of this research is different from previous research, which emphasizes the internal control system to the emergence of opportunities for someone to misappropriate assets and make prevention by improving the internal control system. Several studies have shown that by improving the internal control system, the risk of asset misappropriation will be reduced¹⁵. Researchers see that improving the internal control system alone is not enough to reduce the risk of asset misappropriation. Individuals run an internal control system, so if the individual's character is not good, he cannot run the system properly.

As mentioned earlier, the research that has been carried out is only nominal or quantitative. There are still few researchers who are interested in further investigating qualitative matters against fraud. A. Chariri¹⁶ argues that fraud is a social reality, in which research with a qualitative approach is very helpful in uncovering fraud from a social perspective, not just nominal.

Following the above, the researcher is interested in conducting research with a qualitative approach, especially with the ethnographic method. These ideas arise because there is still little qualitative-based research on fraud, especially asset misappropriation; it is hoped that the findings from this research can enrich forensic accounting science. This research uses PT.YWS (pseudonym) is a private contractor company. The reason for using this company as a research site is because of PT.YWS is a company owned by a regional subsidiary that can develop to obtain several projects both in Indonesia and abroad. The rapidly growing business with a high frequency of employee turnover makes fraud uncontrollable in this sector¹⁷. Indeed, things like this are not surprising, considering that the construction sector is the most corrupt due to the complex nature of doing business and involving many different parties¹⁸.

Theory and Literature Review

Fraud

Fraud can be defined as an illegal act characterized by fraud, concealment, or breach of trust (Institute of International Auditors, n.d). COSO (2013) states that fraud is an act that is intentionally designed to deceive other people (victims) so that the victim will suffer a loss while the perpetrator gains. The definition mentions several characteristics of fraud,

14 Chariri A. *Sociology of Accounting*

15 Feess E., Timofeyev Y. Ibidem. DOI: [10.1108/S1475-14882020000023004](https://doi.org/10.1108/S1475-14882020000023004) (date accessed: 09.09.2022) ; Koomson T. A. A., Owusu G. M. Y., Bekoe R. A., Oquaye M. Ibidem. DOI: [10.1108/JFC-04-2020-0067](https://doi.org/10.1108/JFC-04-2020-0067) (date accessed: 09.09.2022) ; Le T. T. H., Tran M. D. T. The effect of internal control on asset misappropriation: The case of Vietnam. *Business and Economic Horizons*. 2018. Vol. 14. Is. 4. Pp. 941–953. DOI: [10.15208/beh.2018.64](https://doi.org/10.15208/beh.2018.64) (date accessed: 09.09.2022) ; Zakaria K. M., Nawawi A., Salin A. S. A. P. Internal controls and fraud-empirical evidence from oil and gas company. *Journal of Financial Crime*. 2016. Vol. 23. Is. 4. Pp. 1154–1168. DOI: [10.1108/JFC-04-2016-0021](https://doi.org/10.1108/JFC-04-2016-0021) (date accessed: 09.09.2022).

16 Chariri A. *Anti-Fraud*

17 Gunduz M., Onder O. Fraud and Corruption Risk Assessment in Construction Industry. 2012 RICS COBRA International Research Conference (Las Vegas, 11–13.09.2012). 2012.

18 Ibidem.

among others, carried out intentionally and can harm other parties. An action can be categorized as fraud if it fulfills three components: stealing, hiding, and transferring functions. From the point of view of ACFE¹⁹, four main characteristics indicate the occurrence of fraud:

- on purpose;
- false statement;
- material;
- victims suffer losses.

Fraud has three schemes: corruption, misappropriation of assets, and fraudulent inclusion of financial statements²⁰. First, corruption schemes; according to ACFE in the fraud tree, corruption schemes include conflicts of interest, bribery, gratification, and economic extortion. According to the KBBI, corruption is the misappropriation or misuse of state money (companies and so on) for personal or other people's gain. The second misappropriation of assets. Asset misappropriation schemes are by far the most common schemes in companies²¹. The third is the fraudulent scheme of financial statements. According to ACFE²², financial statement fraud is a deliberate misrepresentation of the company's financial condition through misstatement, omission of amounts, or intentional disclosure to deceive financial statement users.

Asset Misappropriations

Black's Law Dictionary, misappropriation is an act of abuse or a shift of purpose to the wrong one. This term includes taking and using other people's property or company property to fair use of the goodwill and reputation of the property owner. Misappropriation of assets is an occupational fraud scheme that is often carried out. Misappropriation of assets refers to the category of employee theft in which an employee steals or misuses resources belonging to a company or organization²³. Cases of misappropriation of assets occupy the top rank, with the most significant percentage of 86%²⁴.

Asset misappropriation schemes are divided into two categories²⁵; cash scheme, inventory, and other assets. The cash schemes are divided into three groups: 1) theft of cash on hand, 2) theft of cash receipts, and 3) fraudulent disbursements. Furthermore, in the second scheme, namely inventory and all other assets, a method is carried out using larceny and misuse ("borrow")²⁶. So far, physical assets such as company equipment and inventory have become easy targets for abusers who use this scheme²⁷. The following are the details of each grouping of asset abuse schemes.

Theft of cash on hand

This scheme is the "easiest" scheme to carry out because of the lack of control of

19 ACFE. *Fraud Examiners* 2017.

20 ACFE. *Occupational Fraud* 2022.

21 ACFE. *Report* 2010 ; ACFE. *Report* 2012 ; ACFE. *Fraud Examiners* 2017 ; ACFE. *Global Study* 2018 ; ACFE. *Report* 2018 ; ACFE. *2020 Report* 2020 ; ACFE. *Occupational* 2022.

22 ACFE. *2020 Report* 2020.

23 ACFE. *Report* 2012.

24 ACFE. *Occupational Fraud* 2022.

25 ACFE. *Occupational Fraud* 2022.

26 Wells J. T. *Corporate Fraud Handbook: Prevention and Detection*. 5th Ed. 2017. DOI: [10.1002/9781119351962.app](https://doi.org/10.1002/9781119351962.app) (date accessed: 09.09.2022).

27 ACFE. *Occupational Fraud* 2022 ; Wells J. T. *Ibidem*. DOI: [10.1002/9781119351962.app](https://doi.org/10.1002/9781119351962.app) (date accessed: 09.09.2022).

an organization and the perpetrator's belief in his actions. The haves has never caught this scheme, and the perpetrator will take cash from the company's drawer or safe ²⁸.

Theft of cash receipts

Asset misappropriation scheme with cash receipts other than customer income is carried out just before the funds are recorded or stored in the company's accounting records. This scheme requires a person to receive funds and avoid accountability controls ²⁹.

Fraudulent disbursements

Fraudulent disbursements are the most common form of asset misappropriation. An employee uses his position to cause improper payments ³⁰. This is an on-book scheme, meaning cash or checks will go wrong.

Social Learning

A. Bandura ³¹ suggests that social learning theory emphasizes the importance of observing, imitating, and imitating the behavior and emotional reactions of others. Social learning theory considers how environmental and cognitive factors influence human behavioral learning. Social learn-

ing is a process of learning and imitation. A process that occurs naturally regardless of the good and the bad. Social learning is a behavior learned through social interaction between individuals within a scope. Social learning involves an ongoing and reciprocal causal relationship between behavior and the imitation of a wrong action ³².

The Concept of Culture in Organisations

There are many ways to define and describe culture. G. P. Ferraro and E. K. Briody ³³ lists that the parts of culture include the economic system, the family, education, social control, the supernatural, and communication. Furthermore, R. Culpan ³⁴ explains that the components of culture are economic, political, religious, and family, while E. T. Hall & M. R. Hall ³⁵ assumes that culture is communication. Culture is a dynamic phenomenon and includes background structures that can coerce and influence individuals in various ways ³⁶. Culture is continuously demonstrated and created through interactions between individuals and is shaped by individuals' behavior.

According to The Business Dictionary, culture udes, beliefs, customs, and rules,

28 Kennedy J. P. Ibidem. DOI: 10.1108/JFC-01-2017-0004 (date accessed: 09.09.2022).

29 Singleton T. W., Singleton A. J. Ibidem.

30 ACFE. *Report ...* . 2012.

31 Bandura A. *Social Learning Theory*. 1st Ed. New Jersey, 1976.

32 Akers R. L. *Social learning and social structure: a general theory of crime and deviance*. New Brunswick, 2009. 469 p. DOI: 10.4324/9781315129587 (date accessed: 09.09.2022).

33 Ferraro G. P., Briody E. K. *The Cultural Dimension of International Business*. New York, 2012. DOI: 10.4324/9781315664415 (date accessed: 09.09.2022).

34 Culpan R. Institutional dominance model for comparative management. *Advances in International Comparative Management*. 1991. Vol. 6. Pp. 127–142.

35 Hall E. T., Hall M. R. *Hidden differences: Doing business with the Japanese*. New York, 1987. URL: https://e-edu.nbu.bg/pluginfile.php/770582/mod_resource/content/1/Edward%20and%20Mildred%20Hall%20-%20Hidden%20Differences%201990.pdf (date accessed: 09.09.2022) ; Hall E. T., Hall M. R. *Understanding Cultural Differences: Germans, French and Americans*. Boston, 1990.

36 Schein E. H. *Organizational Culture and Leadership*. 4th Ed. San Francisco, 2010. 436 p.

both written and unwritten. D. Needle³⁷ states that culture includes vision, values, norms, systems, symbols, language, assumptions, beliefs, and organizational habits. Culture is ultimately a way of doing things or finding ways. Furthermore, H. H. Baligh³⁸ reveals that culture can be a component and part of an organization.

As R. Katanga³⁹ described, “Culture is how organizations ‘do things.’” organizational culture represents the general perception shared by all organization members. Organizational culture can be defined as values and behaviors contributing to the organization’s unique social and psychological environment⁴⁰. Organizational culture is a system that has its meaning held by its members. D. Ravasi & M. Schultz⁴¹ found that organizational culture is a set of shared assumptions that guide the organization by defining appropriate behavior in various situations. H. H. Baligh⁴² defines organizational culture as role cultures in an organization’s work environment.

Research methods

This research uses the ethnography method. The ethnography research method is considered appropriate in this study because it aims to find and understand

the meaning of an event and its relation to culture. Furthermore, this study aims to discover the socio-cultural reasons that can encourage someone to commit an act of misappropriating assets. Ethnography studies can reveal how culture can be used to trigger a fraud incident and find the right way to eradicate it. One of the advantages associated with the ethnographic method is that it can help identify and analyze unexpected problems.

Data Collection and Analysis

The process of collecting data in this study was carried out in two ways: interviews and participant observation. Researchers will conduct interviews with five informants; then conduct participant observations in the company PT.YWS (pseudonym) is the setting of this research. This method allows researchers to create an overview of the organizational culture embedded in PT Yowes. Furthermore, researchers will use secondary data, namely a documentation review, financial reports, asset inventory reports, etc.

Interview

Interviews aim to record opinions, feelings, emotions, and other matters relating to individuals in the organization⁴³. Interviews in this study were conducted by giving open-ended questions to informants

37 Needle D. *Business in Context: An Introduction to Business and Its Environment*. 4th Ed. London, 2004.

38 Baligh H. H. Components of Culture: Nature, Interconnections, and Relevance to the Decisions on the Organization Structure. *Management Science*. 1994. Vol. 40. Is. 1. Pp. 14–27. DOI: [10.1287/mnsc.40.1.14](https://doi.org/10.1287/mnsc.40.1.14) (date accessed: 09.09.2022).

39 Watkins M. D. What Is Organizational Culture? And Why Should We Care? URL: <https://hbr.org/2013/05/what-is-organizational-culture> (date accessed: 09.09.2022).

40 Vimalanathan A. N., Kalaichelvi S., Antony Dr. A Study On Organizational Culture. *International Journal of Research – GRANTHAALAYAH*. 2017. Vol. 5. Is. 8. Pp. 91–95. DOI: [10.5281/zenodo.894489](https://doi.org/10.5281/zenodo.894489) (date accessed: 09.09.2022).

41 Ravasi D., Schlutz M. Responding to organizational identity threats: Exploring the role of organizational culture. *Academy of Management Journal*. 2006. Vol. 49. Is. 3. Pp. 433–458.

42 Baligh H. H. Ibidem. DOI: [10.1287/mnsc.40.1.14](https://doi.org/10.1287/mnsc.40.1.14) (date accessed: 09.09.2022).

43 Chariri A. Philosophical Foundations and Qualitative Research Methods. *Workshop on Quantitative and Qualitative Research Methodology, Accounting Development Laboratory* (Universitas Diponegoro; Semarang, 31.07–01.08.2009). 2009.

with the aim of researchers getting answers that were purely from their thoughts for analysis.

Participant Observation

The following primary method is participant observation. Observing information will be obtained directly by seeing, hearing, and feeling⁴⁴. Observations can be made by observing the behavior of organizational members⁴⁵. Participant observation was chosen in this study because the researcher would blend in with the informant's environment, directly observing the behavior of individuals and their interactions in the research setting⁴⁶. During the observation process, researchers will carry out the following activities: 1) involve themselves in daily activities; 2) make notes (field notes)⁴⁷.

Document Review

Documents to be analyzed can be in the form of official or public documents and documents from the informants' records. The document can provide an overview of the perspectives, assumptions, and activities carried out by the individual who made the document⁴⁸.

Analysis

The ethnography method has a unique analytical technique. This study applies a developmental research sequence analysis model⁴⁹. What is unique about this analytical model is that each analysis requires confirmation. The analysis model in ques-

tion is domain analysis, taxonomic analysis, componential analysis, and theme analysis.

Research Results and Discussion

Considering that asset misappropriation schemes are still the scheme with the most cases⁵⁰, the researcher wants to reveal what triggers the act of asset misappropriation. R. O. Dinata⁵¹ suggests that the culture of an area can shape and encourage someone to commit fraud. Culture always teaches good things, but is it true that culture can be a trigger for evil actions?

Moving on from this, the researcher intends to reveal further whether organizational culture is one of the triggers for the misappropriation of assets in the corporate environment, especially in the private sector how to comprehensively disclose asset misappropriation from a cultural perspective so that new knowledge can be obtained of the socio-cultural reasons that encourage someone to engage in asset misappropriation.

PT.YWS Organizational Culture

Culture is a dynamic phenomenon and background structure capable of coercing and influencing individuals in various ways⁵². Culture is continuously demonstrated, created by individual interactions, and shaped by individual behavior. Culture includes vision, values, norms, systems,

44 Stake R. E. *Qualitative Research : Studying How Things Works*. New York, 2010. 244 p.

45 Brymann A. *Social Research Methods*. 4th Ed. Oxford, 2012. 766 p.

46 Chariri A. *Philosophical Foundations ...* .

47 Ibidem.

48 Bogdan R., Taylor S. J. *Introduction to Qualitative Research Methods: A Guidebook and Resource*. New York, 1975. 266 p.

49 Spardley J. P. *The Ethnographic Interview*. Michigan, 1979. 247 p.

50 ACFE. *Report ...* . 2010 ; ACFE. *Report ...* . 2012 ; ACFE. *Fraud Examiners ...* . 2017 ; ACFE. *Global Study ...* . 2018 ; ACFE. *Report ...* . 2018 ; ACFE. *2020 Report ...* . 2020 ; ACFE. *Occupational ...* . 2022.

51 Dinata R. O., Irianto G., Mulawarman A. D. Ibidem. DOI: 10.21831/economia.v14i1.18453 (date accessed: 09.09.2022).

52 Schein E. H. Ibidem.

symbols, language, assumptions, beliefs, and organizational habits⁵³. As R. Katanga⁵⁴ stated, “Culture is how organizations ‘do things’” organizational culture represents the general perception shared by all organization members. Organizational culture can be defined as values and behaviors contributing to the organization’s unique social and psychological environment⁵⁵. Organizational culture can include an organization’s expectations, philosophies, and values.

An organizational culture is a form of an assumption that is owned and implicitly accepted by the group and can determine how the group feels, thinks, and reacts to its diverse environment. This definition highlights three essential characteristics of organizational culture. First, the organizational culture has been given to new employees through socialization. Second, organizational culture influences employee behavior in the workplace. Third, organizational culture applies at two different levels. Each level varies in terms of outward outlook and resilience to change⁵⁶. S. M. Davis⁵⁷ writes that organizational culture is a pattern of organizational beliefs and values that are understood, inspired,

and practiced (shared) by members of the organization so that the way gives its meaning to the organization concerned and becomes the basis for the rules of behavior within the organization. This understanding provides the purpose that different organizations will have different meaning systems. The difference in the meaning system of one organization causes the organization to have unique characteristics different from those of other organizations⁵⁸.

Organizational culture can be disseminated through rituals, company success stories, ceremonies, myths, and everyday language⁵⁹. The organizational culture in the research company, namely PT.YWS was formed by the leaders and founders. Organizational culture can be implemented effectively if the leader can carry out his role well. The role of the leader can influence the behavior of his subordinates; the following statement clarifies this by informant N;

“... because this is a privately owned company, the rules are not too strict, so the organizational culture here is the same as that of the company owner.”

The statement from informant N is strengthened by the findings of

53 Needle D. Ibidem.

54 Watkins M. D. Ibidem. URL: <https://hbr.org/2013/05/what-is-organizational-culture> (date accessed: 09.09.2022).

55 Vimalanathan A. N., Kalachelvi S., Antony Dr. Ibidem. DOI: [10.5281/zenodo.894489](https://doi.org/10.5281/zenodo.894489) (date accessed: 09.09.2022).

56 Kreitner R. Organizational Behavior. 10th Ed. New York, 2012. 672 p.

57 Davis S. M. Managing Corporate Culture. Cambridge, Mass., 1984. 123 p.

58 Gagliardi P. The Creation and Change of Organizational Cultures: A Conceptual Framework. *Organization Studies*. 1986. Vol. 7. Is. 2. Pp. 117–134. DOI: [10.1177/017084068600700203](https://doi.org/10.1177/017084068600700203) (date accessed: 09.09.2022).

59 Beyer J. M., Trice H. M. How an organization’s rites reveal its culture. *Organizational Dynamics*. 1987. Vol. 15. Is. 4. Pp. 5–24. DOI: [10.1016/0090-2616\(87\)90041-6](https://doi.org/10.1016/0090-2616(87)90041-6) (date accessed: 09.09.2022) ; Martin J., Powers M. Truth or Corporate Propaganda: The Value of a Good War Story. *Organizational Symbolism*. 1983. Pp. 93–107 ; Martin J., Feldman M. S., Hatch M. J., Sitkin S. B. The Uniqueness Paradox in Organizational Stories. *Administrative Science Quarterly*. 1983. Vol. 28. Is. 3. Pp. 438–453. DOI: [10.2307/2392251](https://doi.org/10.2307/2392251) (date accessed: 09.09.2022) ; Trice H. M., Beyer J. M. Studying Organizational Cultures Through Rites and Ceremonials. *The Academy of Management Review*. 1984. Vol. 9. Is. 4. Pp. 653–669. DOI: [10.2307/258488](https://doi.org/10.2307/258488) (date accessed: 09.09.2022).

H. Mintzberg⁶⁰ that a leader has an interpersonal role. In this study, the part of company leaders can create an organizational culture in PT.YWS.

The above is in line with M. Schlutz⁶¹; organizational culture focuses on the beliefs, values, and meanings used by organizational members to understand organizational characteristics. In addition, based on the results of field observations, researchers found that employees adapted to their work environment even though they did not like it. The statement of informant M strengthens the results of field observations.

“I am personally surprised to see the working situation here. Honestly, I’m one of those people who dislike blending in. So when my work was done, I stayed in my chair. But, after a while, I don’t want to go along with *rumpik* [chit-chat] when the work is finished, hehehehe. So I’m ashamed of the story.”

This shows that organizational characteristics arise and are formed because of the cultural practices created by the organization, which encourage each member of an organization to behave following the prevailing culture to be accepted in their environment. Culture consists of unwritten rules that distinguish one group members from another⁶².

Leadership style: the figure of Bapak

G. R. Terry⁶³ argued that leadership is a relationship that exists within an orga-

nization, which includes the activities of leaders in influencing their employees to work together consciously to achieve organizational goals. Furthermore, J. W. Gardner⁶⁴ states that leadership is a persuasion process or example in which an individual encourages a group to pursue goals held by the leader or shared by the leader and his followers, including autocratic, democratic, laissez-faire⁶⁵, and paternalistic leadership styles⁶⁶.

Autocratic — Autocratic or authoritarian leadership. Autocratic leadership is when it focuses power and decision-making on itself. He takes on the role of giving orders and assigning tasks to his subordinates. Leadership with this autocratic style is negative, as employees are threatened and punished if they don’t obey their orders. This leadership style is divided into three classes. First, stubborn autocrats rely on negative influence, using force, fear, and punishment to direct their employees. Second, autocrats are friendly; in this leadership style, the leader will use praise and pats on the back for his employees to complete their tasks. Managers with this style tend to “secure” the loyalty of their employees. Third, manipulative autocrats make employees feel like they have a stake in decision-making when the manager makes the decisions.

Democratic — Democratic leadership. This leadership style decentralizes authority. This is indicated by management, which

60 Mintzberg H. *The Nature of Managerial Work*. New Jersey, 1973. 298 p.

61 Schlutz M. *On Studying Organizational Cultures: Diagnosis and Understanding*. Berlin, 1995. 183 p.

62 Hofstede G., Hofstede G. J., Minkov M. *Cultures and Organizations: Software of the mind*. 3rd Ed. New York, 2010. 430 p.

63 Terry G. R. *Principles of Management*. 6th Ed. Homewood, 1972. 648 p.

64 Gardner J. W. *On leadership: with a preface to the paperback edition*. New York, 1990. 220 p.

65 Yulk G. *Leadership in Organization*. 8th Ed. New Jersey, 2013. 511 p.

66 Westwood R. I. *Headship and Leadership*. *Organizational Behaviour: A Southeast Asian Perspective*. 1992. Pp. 123–139 ; Cheng B. S. *Paternalistic authority and leadership: A case study of a Taiwanese CEO*. *Bulletin of the Institute of Ethnology Academic Sinica*. 1995. Vol. 79. Pp. 119–73 [in Chinese].

always invites employees for advice before making decisions. The employees are directly involved in the decision-making process. Guided by Laissez-faire restraint. Leaders with free moves avoid power and responsibility. The laissez-faire or non-interventional leadership type delegates decision-making responsibility to subordinates and takes minimal initiative in administration. He gave no direction and let the group set their own goals and solve their problems. Managers only play a minor role. The idea is that when left alone, each group member does their best; that way, maximum results can be achieved. The leader acts as a referee. However, the organization will likely fail since no direction or control is exercised over the people.

Next comes Paternalistic leadership. Leadership with this style assumes leaders are fathers or fathers. Paternalism means "father knows best" the relationship between the leader and his group is the same as the relationship between the head of the family and the family members. The leader guides and protects his subordinates as family members.

Of the different leadership styles above, what about the leadership style at PT.YWS? After three months, the researchers made observations on PT.YWS researchers were allowed to attend several company events and have small discussions with some employees. From this, the researcher saw the leadership style in PT.YWS is a combination of several leadership styles, as mentioned above. First paternalistic leadership. Organizational culture can be shaped and internalized by the founders and leaders of the organization⁶⁷. This is evident in PT.YWS, the figure of *Bapak* in PT.YWS as the founder and leader, brings his habits into the culture of

the organization he runs. What he brings and applies to the organization he leads is the family side. The sense of family he brought with him made him a leader and father figure to his employees.

Second, Autocratic — the type that is in PT.YWS, one of which is a kind autocrat. This is proven by the loyalty of the employees who work at PT.YWS. According to several informants, many employees have joined since the company was founded or passed from one project to the next.

- "... For example, Mr. X and Mr. Y have joined with *Bapak* from the very beginning of the project" (Informant D).
- "On average, the people who work here are transferred from one project to a new project and so on. So yeah, long-time people like that" (Informant Y).

In addition, they received no rewards in the form of gratuities or gifts; only a thank you and a pat on the back from the manager were a "gifts" for the employees. This was evident when the researchers attended one of their meetings. After consulting the informant, it turns out that it is a form of "appreciation" for employees who have done an excellent job.

Third, the autocrat — is stubborn. The *Bapak* figure in PT.YWS has central control over running the company, starting from the final decision to small things like his actions which the employees follow. This is not surprising because, in Javanese culture, all crucial decisions are in his (*Bapak*) hands. However, throughout the research period, the researchers found only the "side" of *Bapak* as the decision maker. He never issued harsh penalties, only in the form of reprimanding employees when they were negligent.

67 Adji A. F. R. Revealing The Culture and Mode of Asset Misappropriation : An Ethnographic Study of A Private Contractor Company in The Oil and Gas Sector : unpublished master thesis. Semarang, 2022.

N. Mulder⁶⁸ states that a leader is a *Bapak*, a father figure, a reliable protector who must be respected and followed, whose desires are orders, and who cares for his subordinates (followers). Therefore, those in higher positions must manage, and those in lower positions must obey and follow. This is known as “*Bapakisme*”.

Bapak: reverence and as references

The organizational culture within the PT.YWS organization is shaped by the figure of *Bapak*, the founder, and leader of this company. Regarding the tone at the top in the control environment, the behavior and ethical roles of the leaders are fundamental in shaping and internalizing the culture at PT.YWS. As usual, leaders are always respected by their subordinates. Not infrequently, management decisions do not correspond to the conscience of the employees. This was mentioned by one of the informants as follows:

“... you know, if *Bapak* give the order A which mean ‘it is absolute’ A, even if we think it’s wrong or not, it’s still executed” (Informant B).

Furthermore, the figure of *Bapak* is a role model for his employees. Consistent with A. Chariri’s⁶⁹ findings that subordinates or employees will view the leader as a “*Bapak*” figure and will imitate and follow the leader’s behavior. The uniqueness of

the case in PT.YWS is that the employees imitate not only the leader’s good behavior but also the leader’s bad behavior, as stated by the following informants:

“... they see “*Bapak*,” and they become overconfident...” (Informant Y).

The figure *Bapak* is also suspected of misappropriating assets, such as using company funds for his personal needs and charging household bills to the company. When they see company bosses who can do it “easily,” quite a few of their subordinates follow suit. B. Kellerman⁷⁰ why some leaders are “bad leaders”. Bad leaders misbehave because of who they are and what they want, especially for personal gain. Followers, in this case, are employees who tend to do the same. It is unfortunate that while leaders at PT.YWS can influence and inspire employees⁷¹ tremendously; this applies to good and bad actions by leaders.

Asset Misappropriation:

triggered by leadership style

Discussing leadership styles is difficult because each individual’s leadership style is always different. Among the things that influence a person’s leadership style or environment in which they were raised and educated. Some researchers conclude that success or failure depends heavily on their superiors⁷². Therefore, the leader should be a good role model for subordinates (tone

68 Mulder N. The Ideology of Javanese-Indonesian Leadership. *Leadership on Java : Gentle Hints, Authoritarian Rule*. Surrey, UK, 1994.

69 Chariri A. The dynamics of financial reporting practice in an Indonesia insurance company: a reflection of Javanese views of an ethical social relationship : unpublished PhD thesis. Wollongong, Australia, 2006.

70 Kellerman B. *Bad Leadership: What It Is, How It Happens, Why It Matters*. Boston, 2004, 282 p.

71 Robbins S. P. *Organizational Behavior: Concepts, Controversies and Applications*. Indonesian Ed. Vol. 1. Jakarta, 1996.

72 Hogan R., Curphy G. J., Hogan, J. What we know about leadership: Effectiveness and Personality. *American Psychologist*. 1994. Vol. 49. Is. 6. Pp. 493–504. DOI: [10.1037/0003-066X.49.6.493](https://doi.org/10.1037/0003-066X.49.6.493) (date accessed: 09.09.2022) ; Havaleschka F. Personality and leadership: A Benchmark study of success and failure. *The Leadership & Organization Development Journal*. 1999. Vol. 20. Is. 3. Pp. 114–132. DOI: [10.1108/01437739910268398](https://doi.org/10.1108/01437739910268398) (date accessed: 09.09.2022) ; Kaiser R. B., Hogan R. Chapter 10 the dark side of discretion: Leader personality and organizational decline. *Being There Even When You Are Not*. 2007. Vol. 4. Pp. 173–193. DOI: [10.1016/S1479-3571\(07\)04009-6](https://doi.org/10.1016/S1479-3571(07)04009-6) (date accessed: 09.09.2022).

at the top). Leadership is a series of abilities and personality traits within the leader himself, such as authority, skills, knowledge, and competence, serving to convince those led by him that they are willing and able to carry out the tasks assigned and entrusted to its members by helpful, enthusiastic, happy and don't feel forced.

Leadership is a persuasion process ⁷³. In leadership, leaders are people who act; they will use their skills to make a constructive impact ⁷⁴. In contrast to constructive leadership, the PT.YWS leadership model sees destructive leadership. Destructive leadership is consequential because it reduces the quality of life of everyone it touches ⁷⁵. Leadership concerns those who have led to the organization's overall performance ⁷⁶. Leadership style can, directly and indirectly, affect organizational performance. Leadership behavior can directly influence the attitudes (e.g., commitment, satisfaction) and behavior (e.g., performance) of individual employees ⁷⁷.

The leadership style can be characterized by interpersonal behavior and preferred decision-making patterns. Psychological studies of leadership focus on polite behavior, showing initiative, changing

followers, and other direct methods of interpersonal influence ⁷⁸. The management literature emphasizes decision-making regarding strategy, structure, people, and workforce policies as indirect and impersonal ⁷⁹.

As previously mentioned, leadership style can influence employee behavior and organizational culture. This study found that an individual's leadership style can influence ⁸⁰ and trigger (triggered) the act of misappropriating assets in PT.YWS. This was conveyed by several informants as follows:

- "... *Bapak* is very kind, so he rarely gets angry with us; at least he only reprimanded us." (Informant B).
- "... he is a good person and can't stand the person, stuck at the most reprimanded or just let it go.. or at least you just say "it's okay, tomorrow don't do it again"" (Informant Y).

Asset misappropriation can spread through the PT.YWS organization due to the leadership style of *Bapak*, which is always friendly and doesn't seem to care about the crimes committed by his associates. He never imposed a punishment that deterred the offender and regretted his actions.

73 Gardner J. W. Ibidem.

74 Tjosvold D., Tjosvold M. M. *Becoming Committed to Leading*. USA: John Wiley & Son, Inc., 1995.

75 Hogan R., Kaiser R. B. What We Know About Leadership. *Review of General Psychology*. 2005. Vol. 9. Is. 2. Pp. 169–180. DOI: [10.1037/1089-2680.9.2.169](https://doi.org/10.1037/1089-2680.9.2.169) (date accessed: 09.09.2022).

76 Waldman D. A., Yammarino F. J. CEO charismatic leadership: levels-of-management and levels-of-analysis effects. *Academy of Management Review*. 1999. Vol. 24. Is. 2. Pp. 266–285. DOI: [10.2307/259082](https://doi.org/10.2307/259082) (date accessed: 09.09.2022) ; Waldman D. A., Ramirez G. G., House R. J., Purnam P. Does leadership matter? CEO leadership attributer and profitability under conditions of perceived environmental uncertainty. *Academy of Management Journal*. 2017. Vol. 44. Is. 1. Pp. 134–143. DOI: [10.5465/3069341](https://doi.org/10.5465/3069341) (date accessed: 09.09.2022).

77 Dansereau F., Graen G. B., Haga W. J. A Vertical Dyad Linkeage Approach to Leadership within Formal Organizations. *Organizational Behavior and Human Performance*. 1975. Vol. 13. Is. 1. Pp. 46–78. DOI: [10.1016/0030-5073\(75\)90005-7](https://doi.org/10.1016/0030-5073(75)90005-7) (date accessed: 09.09.2022).

78 Bass B. M. Bass & Stogdill's Handbook of Leadership: Theory, Research, and Managerial Application. 3rd Ed. New York, 1990.

79 Finkelstein S., Hambrick D. C. *Strategic Leadership : Top Executives and Their Effects on Organizations*. Minnesota, 1996.

80 Kim W. C., Mauborgne R. Parables of Leadership. *Harvard Business Review*. 1992. Pp. 123. URL: <https://hbr.org/1992/07/parables-of-leadership> (date accessed: 09.09.2022).

Conclusion

The leader is the one who initiates the action, while the members of the organization help facilitate the movement. This relationship makes ethical behavior and organizational integrity vital because they can prevent fraud⁸¹. A leader should have a good attitude towards professionalism and ethics to create a healthy work environment. J. S. Adams et al.⁸² found that a leader will influence ethical standards and the business climate.

As previously mentioned, most fraud research still revolves around quantitative technical aspects. Previous research emphasized internal control to identify opportunities for asset misappropriation and prevent it by improving internal control. However, improving the internal control system alone is considered less effective in reducing the number of fraud cases, as fraud is increasing yearly⁸³.

Researchers see the possibility of ample opportunity to minimize the occurrence of fraud in organizations with a cultural approach. This is reasonable because if fraud can be prevented and detected as early as possible, A. Chariri⁸⁴ suggests that organizations should focus more on prevention and early detection than on investigation.

The result of this study indicates several things. First, the organizational culture within PT.YWS is brought and shaped by

the habits of the founders and leaders. This is because PT.YWS is a privately owned company, meaning it is the founder's personal property. Second, leadership style can trigger asset misappropriation in the organizational environment. The leadership style of the father figure who never punishes employees who commit acts of misappropriation of assets is used as an 'opportunity' by the fraud perpetrators. They are sure they will not be penalized, so they can freely carry out acts of misappropriation of assets. Bad leadership is as endemic to the human condition as good leadership⁸⁵. It is deeply regretted that this issue is deliberately ignored and even normalized. Third, fraud, with all its schemes, is a social reality. Cases that occur in an organization are getting higher because of social interaction (source). Employees see a gap in the existence of indiscriminate treatment from their leaders so that they feel safe and comfortable in committing acts of asset misappropriation.

Throughout the research period, researchers can see social relativity that accounting is not just a practice that involves procedural and technical aspects alone but can be seen as a practice that reflects socio-cultural dimensions. P. Miller⁸⁶ states that accounting is not a tool for documenting and reporting the facts of economic activity but also an intrinsic and constitutive practice of social relations.

81 Paine L. S. Managing for organizational integrity. *Harvard Business Review*. 1994. Pp. 17–106.

82 Adams J. S., Taschian A., Shore T. H. Ethics in Family and Non-Family Owned Firms: An Exploratory Study. *Family Business Review*. 1996. Vol. 9. Is. 2. DOI: 10.1111/j.1741-6248.1996.00157.x (date accessed: 09.09.2022).

83 ACFE. *Report ...* . 2010 ; ACFE. *Report ...* . 2012 ; ACFE. *Fraud Examiners ...* . 2017 ; ACFE. *Global Study ...* . 2018 ; ACFE. *Report ...* . 2018 ; ACFE. *2020 Report ...* . 2020 ; ACFE. *Occupational ...* . 2022.

84 Chariri A. *Sociology of Accounting ...* .

85 Allio R. J. Barbara Kellerman: There's a better way to train leaders. *Strategy & Leadership*. 2018. Vol. 46. Is. 6. Pp. 22–27. DOI: 10.1108/SL-09-2018-0083 (date accessed: 09.09.2022).

86 Miller P. Accounting as social and institutional practice: an introduction / Hopwood A., Miller P. *Accounting as social and institutional practice*. Cambridge, 1994. Pp. 1–39. DOI: 10.2307/2076997 (date accessed: 09.09.2022).

This is in line with J. Davison⁸⁷, who argues that the accounting discipline has an extensive scope.

This broad scope leads to multi-paradigm accounting; aspects of the multi-paradigm that exist in accounting arise because accounting can be combined with other sciences, one of which is forensics. Forensics is a field of science designed to aid in the process of upholding justice through the process of applying science or science. What is learned from forensic accounting not only concerns how an organization becomes a victim of fraud or how the flow of company funds can be manipulated in this way, but forensic accounting also examines the behavior of fraudsters. The purpose is that in the future, organizations can find the right way to minimize the occurrence of fraud in their environment. From this, forensic accounting has become a collection of different disciplines, such as accounting, sociology, law, culture, criminology, computer science, and psychology.

The implication of this research is to expand the scope of previous research on fraud prevention, which so far has only focused on internal control with a quantitative approach. The findings in this study indicate that fraud is a social reality triggered by the leadership style of leaders in an organization.

This result is based on an organization's socio-cultural context, which is different from the results of previous studies. Thus, this research can provide implications for the development of forensic accounting science and can be a reference for further research in investigating forensic accounting issues from a socio-cultural perspective. Furthermore, this research also provides implications for the research site company, namely PT.YWS in

understanding and learning about fraud, and particularly asset misappropriation schemes.

Finally, due to the limitations of this study, the researcher was not allowed to document several documents because the issues raised in this study were very sensitive. Furthermore, future studies are expected to involve different companies from different industrial sectors. This is necessary to test the consistency of research results, can leadership style trigger asset misappropriation in a company?

**Роль стилю керівництва
у незаконному привласненні активів:
етнографічне дослідження**

**Азізах Фаттіх Резк'ях Аджі,
Аніс Чарірі**

Це етнографічне дослідження, проведене в приватній будівельній компанії у нафтогазовій сфері. Дослідження має на меті виявити соціальні й культурні причини незаконного привласнення активів співробітниками організації. Привласнення активів — це схема професійного шахрайства, яка часто стається повторно. 2022 р. кількість випадків, скоєних за цією схемою, дорівнює приблизно 86 % і посідає перше місце (згідно із заявою Асоціації сертифікованих експертів із шахрайства). Основне питання цього дослідження полягає в тому, який стиль лідерства може сформувати організаційну культуру та стати одним із провокативних чинників для незаконного привласнення активів в організації. Крім того, у дослідженні ухвалено висновок про те, що лідери здатні формувати й реалізовувати організаційну культуру, а шахрайство (як соціальну реальність) можна спровокувати стилем лідерства. Аспекти

87 Davison J. Barthesian perspectives on accounting communication and visual images of professional accountancy. *Accounting Auditing & Accountability*. 2011. Vol. 24. Is. 2. Pp. 250—283. DOI: [10.1108/09513571111100708](https://doi.org/10.1108/09513571111100708) (date accessed: 09.09.2022).

мультипарадигми в бухгалтерському обліку зумовлено його поєднанням з іншими науками, однією з яких є судова експертиза. Судова експертиза — це галузь науки, покликана обстоювати справедливість за допомогою науки. Результати економічної експертизи стосуються не лише того, через що компанія стає жертвою шахрайства або як саме можна маніпулювати її коштами, а й вивчення поведінки шахраїв. Мета полягає в пошуку правильних способів і найкоротших шляхів для того, щоб у майбутньому взагалі уникнути або принаймні максимально запобігти шахраям і шахраюванням в економічній діяльності компанії (організації). Із цього моменту економічна експертиза стає сукупністю різних дисциплін — таких, як бухгалтерський облік, соціологія, право, культура, кримінологія, інформатика та психологія.

Ключові слова: шахрайство; незаконне привласнення активів; судово-бухгалтерська експертиза; організаційна культура; соціальна освіта; стиль лідерства.

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Declaration of Competing Interest

Authors declare no conflict of interest.

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Issues of Combating Corruption Oriented Crimes: Forensic Science Aspect

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Activities of anticorruption system specialized bodies of Ukraine and its mechanisms are analyzed. The article purpose is to investigate possibilities and forensic science role on (in particular, specific expertise application) for investigation of corruption-oriented crimes and anticorruption legislation improvement. Methodological basis of the research is a situational analysis (case study). Forensic expert, conducting examination, discovers factual data and circumstances that contribute (could contribute) to commission of corruption and related offenses. Based on examination results of the objects submitted for examination, forensic expert presents in the conclusion discovered data that are important for criminal proceedings and about which he was not asked any questions. Preventive recommendations about circumstances and facts that contributed (could contribute) to the crime commission that can be provided by forensic expert, will help to prevent corruption and corruption related offenses will help state bodies to combat corruption and increase effectiveness of its prevention mechanisms. As mechanisms for expert prevention implementation, scientific and forensic institutions are proposed to generalize forensic expert practice and provide anticorruption system bodies of Ukraine with information that would contain analysis and proposals for prevention of corruption and related offenses that should be established at legislative level.

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Keywords: anticorruption system bodies of Ukraine; corruption risks; prevention of corruption and corruption-related offenses; anticorruption legislation; forensic science; investigation of corruption crimes; forensic expert conclusion.

Research Problem Formulation

Unstable situation in security field of any state is a powerful catalyst for corruption, most often according to the principle “war will destroy everything.” Israel has been in a state of permanent war since 1949, active hostilities occur approximately once every 7 years. There is even a special concept of “war between wars” as endless clashes between the army and police with terrorists that sometimes turn into weeks-long missile attacks on the country territory.

On February 24, 2022, the Russian Federation launched a full-scale invasion of Ukraine with all the negative consequences and challenges for all spheres of the state’s

life. At the same time (with the support of most countries of the world), positive trends for the integration of Ukraine into the European community emerged. Thus, on February 28, 2022, Ukraine submitted an application to join the European Union (hereinafter referred to as the EU) ¹. It is worth noting that at first 68 % of Ukrainians were in favor of this step, later: 86 %, and as of the end of March: 91 % ² (which is an absolute record for all years of research ³). The European Parliament ⁴, the European Commission⁵ and the European Council ⁶ supported the Ukrainian application, and on June 23, 2022, EU leaders at the summit in Brussels (Belgium) approved the decision to grant Ukraine the status of a candidate

- 1 Володимир Зеленський підписав заявку на членство України у Європейському Союзі / Президент України Володимир Зеленський. Офіційне інтернет-представництво. URL: <https://www.president.gov.ua/news/volodimir-zelenskij-pidpisav-zayavku-na-chlenstvo-ukrayini-u-73249> (date accessed: 22.07.2022).
- 2 Support for EU accession hits record high at 91% in Ukraine, while that for joining NATO slides – poll. *Ukrinform*. November 30, 2022. URL: <https://www.ukrinform.net/rubric-society/3449439-support-for-eu-accession-hits-record-high-at-91-in-ukraine-while-that-for-joining-nato-slides-poll.html> (date accessed: 22.07.2022).
- 3 Record number of Ukrainians support joining EU, backing for NATO membership falls – poll. *Reuters*. April 5, 2022. URL: <https://www.reuters.com/world/europe/record-number-ukrainians-support-joining-eu-backing-nato-membership-falls-poll-2022-04-05/> (date accessed: 22.07.2022).
- 4 Європарламент рекомендував надати Україні статус кандидата на вступ до ЄС. *Європейська правда*. 01.03.2022. URL: <https://web.archive.org/web/20220331213746/https://www.eurointegration.com.ua/news/2022/03/1/7135011/> (date accessed: 22.07.2022).
- 5 Rauhala E., Suliman A., Ariès Q. Ukraine should get E.U. candidate status, European Commission recommends. *The Washington Post*. June 17, 2022. URL: <https://www.washingtonpost.com/world/2022/06/17/european-commission-candidate-eu-ukraine-war/> (date accessed: 22.07.2022).
- 6 Європарламент підтримав кандидатський статус для України і Молдови. *Європейська правда*. 23.06.2022. URL: <https://www.eurointegration.com.ua/news/2022/06/23/7141870/> (date accessed: 22.07.2022).

for EU membership ⁷. Undoubtedly, the recommendations of the European Commission regarding the granting of candidate status to Ukraine have a positive effect not only on the economy of Ukraine, but also on the state of the fight against corruption.

The European Commission put forward 7 requirements for our country's membership in the EU, in particular, regarding the fight against corruption: complete appointment of the Head of the Specialized Anti-Corruption Prosecutor's Office (hereinafter referred to as SAPO) and the director of the National Anti-Corruption Bureau (hereinafter referred to as NABU), as well as the integrity check by the Ethics Council of candidates for members of the Higher councils of justice and selection to the High Qualification Commission of Judges of Ukraine; increase the efficiency of anti-corruption investigations in the highest echelons of power; introduce legislation on the procedure for selecting judges of the Constitutional Court based on the evaluation of their integrity and professional skills in accordance with recommendations of the Venice Commission. Therefore, advancement speed towards full membership in the EU depends from now on the changes in Ukraine ⁸.

Improvement of anti-corruption legislation on the basis of world standards is a logical result of Ukrainian integration processes, a means of implementing obligations to world community, designed to continue the implementation of

international best practices in the field of preventing and combating corruption. Unfortunately, after 24.02.2022, formation dynamics of corruption environment, that complicates functioning of all social and state mechanisms, changes rather slowly. Positive driving mechanism in this case is forensic expert activity, which means can be useful both during investigation of corruption crimes and for preventive purposes. Thereby it is relevant to study forensic science possibilities of (in particular, specific expertise application) to improve the anti-corruption legislation.

Analysis of Essential Researches and Publications

Scientific basis of the research is laid research papers of famous forensic scientists in the field of solving issues of criminalistics, legal sciences and forensic expert practice. Thus, O. V. Tymchenko notes: increasing the role of preventive activities of forensic science institutions will manifest itself, *"firstly, in the fact that expert during forensic examination identifies the causes and circumstances that contribute to commission of criminal offenses and informs the police units about. Secondly, it is the result of generalization of forensic expert practice, accumulation and analysis of forensic information about the reasons for committing criminal offenses in order to increase effectiveness of law enforcement officers' preventive activities"* ⁹.

V. A. Zhuravel investigated the issue of expert prevention as a complex systemic

7 Україна офіційно отримала статус кандидата на вступ в ЄС. *Ibidem*. URL: <https://www.euro-integration.com.ua/news/2022/06/23/7141922/> (date accessed: 22.07.2022).

8 Які реформи необхідні для відновлення України? *Transparency International Ukraine*. 04.07.2022. URL: <https://ti-ukraine.org/news/yaki-reformy-neobhidni-dlya-vidnovlennya-ukrayiny/> (date accessed: 22.07.2022).

9 Тимченко О. В. Оптимізація судово-експертної діяльності на основі удосконалення інформаційно-доказової бази з урахуванням світового досвіду. *Вісник ОНДІСЕ*. 2017. № 2. URL: <http://ondise.od.ua/DOC/vipusk2/vipusk22017.pdf> (date accessed: 22.08.2022).

formation, which principles the activity of forensic experts guided by their specific expertise, find out the reasons for commission of criminal offenses¹⁰. O. P. Snigerov and N. Ye. Filipenko analyzed the conceptual principles, views and ideas on understanding essence and forms of interaction of forensic institutions with law enforcement and judicial authorities in the implementation of preventive measures¹¹. O. Litvinov and Ha. Spitsyna investigated the counteraction to crime in the focus of network approach¹².

N. Ye. Filipenko, O. P. Uhrovetskyi and O. V. Sharapova came to the conclusion that preventive activities of forensic science institutions of Ukraine should be carried out: during forensic examinations of specific criminal, administrative or civil cases; by generalizing expert and forensic practice; in the process of scientific research on the problems of expert prevention; by providing scientific and practical assistance on the basis of specific expertise to state bodies and public organizations in identifying circumstances that contribute to the commission of crimes, etc.¹³

A number of research papers by foreign and domestic authors are devoted to research on of the causes and conditions, identification and cessation of corruption activities and peculiarities of prevention of its various species.

Thus, D. Kos concluded that after the war, the Ukrainian government, with the support of the international community, will have important tasks: renewal and strengthening of the activities of national anti-corruption bodies, while restoring the functions of the public to monitor these activities¹⁴. I. Luna-Pla and J. R. Nicolás-Carlock identified indicators of corruption in public procurement and indicators of corruption risk (in particular, in ownership and management structures)¹⁵. A. F. Martins, B. R. da Cunha, Q. S. Hanley and other scholars have found out (using the example of political scandals in Brazil and Spain for almost three decades) that corruption networks operate on the verge of a critical level of recidivism, below which the network becomes completely fragmented, and above excessively connected which indicates that actions

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- 10 Журавель В. А. Стан та перспективи експертної профілактики. *Актуальні питання судової експертизи та криміналістики* : зб. мат-лів «кругл. столу», присвяч. 80-річ. створ. ХНДІСЕ ім. Засл. проф. М. С. Бокариуса (Харків, 11–12.11.2008). Харків, 2008. С. 36–40.
 - 11 Снігерьев О. П., Філіпенко Н. Є. Окремі питання взаємодії та координування роботи судово-експертних установ України з іншими суб'єктами під час здійснення превентивної діяльності. *Теорія та практика судової експертизи і криміналістики*. 2020. Вип. 21. С. 194–217. DOI: [10.32353/khrife.1.2020_13](https://doi.org/10.32353/khrife.1.2020_13) (date accessed: 22.08.2022).
 - 12 Lytvynov O., Spitsyna H. Kriminalitätsbekämpfung Im Fokus Des Netzwerkansatzes. *Archives of Criminology and Forensic Sciences*. 2021. Vol. 1 (3). Pp. 50–57. DOI: [10.32353/acfs.3.2021.04](https://doi.org/10.32353/acfs.3.2021.04) (date accessed: 22.08.2022).
 - 13 Філіпенко Н. Є., Угровецький О. П., Шарапова О. В. Теоретичні основи експертної профілактики: поняття та завдання. *Теорія та практика судової експертизи і криміналістики*. 2019. Вип. 20. С. 151–161. DOI: [10.32353/khrife.2.2019.11](https://doi.org/10.32353/khrife.2.2019.11) (date accessed: 22.08.2022).
 - 14 Kos D. War and Corruption in Ukraine. *Eucrim*. 2022. Is. 2. Pp. 152–157. DOI: [10.30709/eucrim-2022-007](https://doi.org/10.30709/eucrim-2022-007) (date accessed: 22.08.2022).
 - 15 Luna-Pla, I., Nicolás-Carlock, J. R. Corruption and complexity: a scientific framework for the analysis of corruption networks. *Applied Network Science*. 2020. Vol. 5. Is. 13. DOI: [10.1007/s41109-020-00258-2](https://doi.org/10.1007/s41109-020-00258-2) (date accessed: 22.08.2022).

aimed at reducing corruption recidivism can significantly mitigate this organized crime species¹⁶.

E. V. Rasiuk drew attention to the problem of failure to study conditions and causes of a specific corruption criminal offense, therefore, failure to carry out a comprehensive analysis of criminogenic determinants of all corruption crime, making it impossible to timely preventative influence on it¹⁷. N. V. Hryshyna and K. V. Rostovska considered the issue of scientific support by the State anti-corruption policy during its development and implementation, as well as the formation peculiarities of modern infrastructure of scientific expert and analytical activity¹⁸.

At the same time, forensic science possibilities of for improving anti-corruption legislation are still not sufficiently studied, so the article topic is relevant and has theoretical and practical significance.

Article Purpose

Investigate possibilities and role of forensic science (in particular, specific expertise use) investigate corruption-oriented crimes and improve anti-corruption legislation.

Research Methods

The methodological basis of the research is situational analysis, or case-study, “*which content is the study of a single social object (situation, event, case, person, social group) or several demonstrative objects to understand a wider class of similar cases (class of events)*”¹⁹. This method advantage is informativeness, in another words, accumulation of significant amount of empirical data to understand how a crime occurs, how it can be prevented, as well as to clarify crucial importance of forensic science in crime prevention.

General scientific methods (observation, comparison, description, classification) were chosen to cover activities of specialized anti-corruption bodies of Ukraine and mechanisms designed to combat corruption during the war, as well as the role of forensic science while investigation of corruption and related criminal offenses.

The system-structural method is used to consider species of investigative (search) actions, tactical operations during investigation of cases in order to obtain improper benefits by officials requiring appointment of a number of forensic examinations. Formal-legal method

- 16 Martins A. F., da Cunha B. R., Hanley Q. S. et al. Universality of political corruption networks. *Scientific Reports*. 2022. Vol. 12. DOI: [10.1038/s41598-022-10909-2](https://doi.org/10.1038/s41598-022-10909-2) (date accessed: 22.08.2022).
- 17 Расюк Е. В. Проблемні питання взаємодії спеціальних суб'єктів запобігання корупції під час здійснення заходів з протидії корупційній злочинності в Україні. *Науковий вісник Ужгородського національного університету. Серія: Право*. 2022. Вип. 70. С. 435–443. DOI: [10.24144/2307-3322.2022.70.70](https://doi.org/10.24144/2307-3322.2022.70.70) (date accessed: 22.08.2022).
- 18 Гришина Н. В., Ростовська К. В. Щодо питання наукового супроводу державної антикорупційної політики. *Вісник Харківського національного університету імені В. Н. Каразіна. Серія «ПРАВО»*. 2021. Вип. 32. С. 27–32. URL: <https://periodicals.karazin.ua/law/article/view/17819/16765> (date accessed: 22.08.2022).
- 19 Аналіз ситуаційний, кейс-стаді (метод дослідження) / Велика українська енциклопедія. URL: [https://vue.gov.ua/%D0%90%D0%BD%D0%B0%D0%BB%D1%96%D0%B7_%D1%81%D0%B8%D1%82%D1%83%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D0%B8%D0%B9_%D0%BA%D0%B5%D0%B9%D1%81-%D1%81%D1%82%D0%B0%D0%B4%D1%96_\(%D0%BC%D0%B5%D1%82%D0%BE%D0%B4_%D0%B4%D0%BE%D1%81%D0%B-D1%96%D0%B4%D0%B6%D0%B5%D0%BD%D0%BD%D1%8F\)](https://vue.gov.ua/%D0%90%D0%BD%D0%B0%D0%BB%D1%96%D0%B7_%D1%81%D0%B8%D1%82%D1%83%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D0%B8%D0%B9_%D0%BA%D0%B5%D0%B9%D1%81-%D1%81%D1%82%D0%B0%D0%B4%D1%96_(%D0%BC%D0%B5%D1%82%D0%BE%D0%B4_%D0%B4%D0%BE%D1%81%D0%B-D1%96%D0%B4%D0%B6%D0%B5%D0%BD%D0%BD%D1%8F)) (date accessed: 22.08.2022).

(contributed to clarification of the content of legal norms governing relations in the field under research), structural-functional and dialectical methods, methods of induction, deduction, synthesis, abstract-logical and legal analysis (for research on interaction of participants in anti-corruption system and generalization of research results), etc. were applied.

Main Content Presentation

On the day of Russian aggressor invasion, the most difficult period for Ukraine began from the moment of independence. Rocket strikes, bombardments and artillery shells destroy infrastructure and destroy people. The war caused a large-scale evacuation of enterprises and migration of the population. Thus, new conditions of economic activity. However, all State institutions should work together in joint projects to counteract occupiers, in order to every citizen of Ukraine can return to normal life as soon as possible.

We consider corruption to be one of the factors that works in favor of the Russian occupiers, consequently effective counteraction to this shameful phenomenon (in particular, introduction of preventive measures) is one of the ways to victory for Ukraine.

Corruption as a systemic phenomenon is diverse: economic, political, domestic, moral and ideological. In addition, it is not always clear what is primary and what is secondary in this list: are corrupt morals and worldviews the cause of corruption or its consequences?

Corruption in society still exists up today, although in different countries the attitude to it varies, while corruption itself

is condemned as a phenomenon in any culture, since most countries have adopted anti-corruption legislation. Despite a significant amount of scientific research and numerous international agreements aimed at developing anti-corruption legislation, there is still no universally accepted definition of corruption.

The corruption phenomenon of in no case can be considered abstractly, outside of cultural specifics, because there are societies and countries where corruption is the usual way of life, when gifts are not considered a bribe, as well as assistance to family members in holding a certain position (nepotism). Various options for dividing corruption as a phenomenon are possible: demand side and the supply side; active and passive bribery; administrative and political corruption; public and private; situational and systematic; small and large; local (regional) and centralized.

Corruption occurs when a responsible person or party accepts an illegal reward, receives an advantage (in monetary or non-monetary form, in the form of any other benefit) or violates the rules on avoidance of conflict of interest. The benefit is not necessarily assigned to this person: recipient can be someone else (for example, a political party).

When considering corruption, it is worth remembering R. Klitgaard, an American economist, the author of the "corruption formula":

$$\text{corruption} = \text{monopoly} + \text{discretion} - \text{accountability}^{20}$$

(In other words, corruption is greed plus opportunity minus control). In his opinion, corruption is a crime based on calculation, not emotions. He believes that people are prone to corruption when the risks are

20 Klitgaard R. Fighting Corruption. *CESifo DICE Report*. 2011. Vol. 09. Is. 2. Pp. 31–35. URL: <https://www.econstor.eu/bitstream/10419/167035/1/ifo-dice-report-v09-y2011-i2-p31-35.pdf> (date accessed: 22.08.2022).

small, the punishment is mild, and the gain is significant²¹.

It is difficult to assess the economic consequences of frequent cases of corruption. It is possible to distinguish negative consequences of corruption (although in fact they are all related) for:

- for Democracy and Rule of Law;
- social services (primarily healthcare and education);
- economic development.

Where corruption is pervasive, citizens experience lawlessness: although formally rules and laws exist, everyone knows they are not respected. As a result, a complete loss of trust in the system. Since 1995, *Transparency International* has computed the Corruption Perceptions Index every year. Corruption Perception Index, hereinafter referred to as CPI) in 180 countries (according to the results of expert assessment and population surveys). According to the CPI, the least corrupt for many years are Denmark, Finland and New Zealand; on the other hand, Syria, Somalia and South Sudan are on the list (Russia – 136th, Ukraine – 122nd, Israel – 36th)²². Places in countries with different ratings can vary depending on how information is collected and processed.

According to a survey of the Kyiv International Institute of Sociology (commissioned by the Center for Social

and Economic Research CASE Ukraine), the question: “What would be the greatest disappointment for you after the end of the war?” Ukrainians most often answered: “Impunity of Russia for crimes committed” (65.8%). Among the three options, the second and third places were taken by the answers: “High level of corruption” (36.3%) and “Low standard of living, poverty” (34.6%)²³ (this is on condition that the level of corruption in Ukraine is considered quite high, and the standard of living is quite low).

Despite Israel 36th place in the CPI, the population of that country is confident in the corruption of the prosecutor’s office, the court, and State inquiry authorities. Such a crisis of confidence in the system has formed over the past 30 years. Traditionally, the confidence level of Israelis in the judicial system, the police and the army were very high, but currently they trust only the army, that has a separate judicial investigative system. The catalysts of such distrust can be considered two unrelated trials:

- the case of the murder of a thirteen-year-old schoolgirl (2016)²⁴;
- the case of former Prime Minister Benjamin Netanyahu accused of corruption and abuse of office for personal purposes.

Criminal case of the murder of a schoolgirl is currently in another

21 Klitgaard R. Op. cit. URL: <https://www.econstor.eu/bitstream/10419/167035/1/ifo-dice-report-v09-y2011-i2-p31-35.pdf> (date accessed: 22.08.2022).

22 Corruption Perceptions Index. URL: <https://www.transparency.org/en/cpi/2021> (date accessed: 22.08.2022).

23 Непокарання Росії після війни розчарує українців більше, ніж бідність чи корупція. CASE Україна. 28.09.2022. URL: <https://case-ukraine.com.ua/news/nepokarannya-rosiyi-pislya-vi-jny-rozcharuye-ukrayintsiv-bilshе-nizh-bidnist-chy-koruptsiya-infografika/> (date accessed: 22.08.2022).

24 Levinson C., Cohen G., Efrati I. Palestinian Man Stabs and Kills 13-year-old Israeli Girl Asleep in Her West Bank Home. *Haaretz*. Jun 30, 2016. URL: <https://www.haaretz.com/israel-news/2016-06-30/ty-article/palestinian-fatally-stabs-israeli-girl-inside-west-bank-home/0000017f-e699-d62c-a1ff-feb94520000> (date accessed: 22.08.2022).

retrial, according to the general opinion the accused will soon be released due to lack of evidence, having served 15 years in prison. The Netanyahu case is falling apart in court: according to the authors, it was fabricated by the prosecutor's office and the police with the aim of a quiet and bloodless political putsch, removal from power of a popular leader on the task of the political opposition which lost him in the democratic elections²⁵.

Situational Crime Prevention, (hereinafter referred to as SCP)²⁶, in particular, prevention of corruption crimes is based on the belief that crime can be contained only by strategically changing environment by focusing on how (and not why) *crime occurs and how it can be prevented*.

In Ukraine (according to Part 1, Article 1 of the Law of Ukraine: *On Prevention of Corruption*), "specially authorized entities in the field of anti-corruption: bodies of the Prosecutor's office, National Police, National Anti-Corruption Bureau of Ukraine, National Agency for Prevention of Corruption (NAPC)"²⁷. have been created in recent years". Bodies of anti-corruption system of Ukraine: NABU, State Bureau of Investigation (hereinafter referred to as SBI), Strategic Investigations Department of the National Police of Ukraine (hereinafter referred to as SID), Security Service of Ukraine, SAPO, Asset Recovery and Management Agency (hereinafter referred to as ARMA) and

High Anti-Corruption Court of Ukraine (hereinafter referred to as HACC) adapted to the realities of war and reoriented their work to achieve the victory of Ukraine: today the efforts of lawyers-scientists and practitioners are focused on enrichment of knowledge in the field of investigation of war crimes (in particular, related to Russian assets). NABU detectives and SAPO prosecutors continue to conduct pre-trial investigations and expose violators of the law.

With the war beginning, the NABU and SAPO referred more than 20 high-profile cases to court. For example, the investigation into the misappropriation of funds by *Ukrainian Railways JSC* during the implementation of the service for the sale of electronic tickets for the *Kyiv Boryspil Express* established that in 2018, despite the existence of an e-ticket sales system, officials *Ukrainian Railways JSC* initiated the purchase of other software, which, under the guise of modernization, was planned to be introduced in all directions of traffic, displacing the rest of the developers in a non-competitive manner. Forensic examination carried out as part of the pre-trial investigation established that the purchased software of *Ukrainian Railways* for the sale of tickets for the *Kyiv Boryspil Express* duplicates functional capabilities of the existing electronic service, thereby depriving the state of profits²⁸. For example, in the 2017 investigation into the abuse of official

25 Премьер Израиля Нетаньяху предстал перед судом по делу о коррупции. *BBC News*. 24 мая 2020. URL: <https://www.bbc.com/russian/news-52792810> (дата звернення 18.09.2022).

26 Freilich J. D., Newman G. R. Situational Crime Prevention: Historical Background and Origins of the Idea. *Oxford Research Encyclopedias. Criminology and Criminal Justice*. 29 March 2017. DOI: [10.1093/acrefore/9780190264079.013.3](https://doi.org/10.1093/acrefore/9780190264079.013.3) (date accessed: 22.07.2022).

27 Про запобігання корупції : Закон України від 14.10.2014 р. № 1700-VII (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/1700-18#Text> (date accessed: 22.07.2022).

28 Е-квитки на «Бориспільський експрес»: справу скеровано до суду / Національне антикорупційне бюро України. 16.05.2022. URL: <https://nabu.gov.ua/novyny/e-kvytky-na-boryspilsky-ekspres-spravu-skerovano-do-sudu> (date accessed: 22.07.2022).

position by officials of *Pervomaiskvuhillia* State Enterprise, while overestimation of the cost and scope of the works performed by the general contractor selected without a tender amounted to more than UAH 17 million, and the embezzlement of almost UAH 3.5²⁹, million was prevented, the special knowledge of forensic experts in the field of technical examination of documents, handwriting and author studies is useful. To establish the facts and circumstances of the embezzlement of budget funds by officials of the *Ukrinmash* State enterprise which with participation of a private company organized the supply abroad of products produced at other enterprises of *Ukroboronprom* which ultimate beneficiary was a person who had friendly relations with one of the top managers of the State enterprise, there was a need³⁰ for a handwriting examination and a study of document details.

Investigation into the facts of committing acts in order to seize State power, obstruct the work of the High Qualifications Commission of Judges of Ukraine, participation in criminal organization and abuse of influence on

judges in collusion with other persons involves the study of thousands of hours of audio recordings of suspects³¹ (in particular, regarding person identification o by physical parameters of voice and linguistic signs of oral speech³²).

On the charge of a person exposed for fraud and incitement to provide illegal benefits, it was established that the former director of the SBI, together with another person, planned to receive 150 thousand dollars from the capital developer for the closure of criminal proceedings of the territorial administration³³ of the SBI. During investigation of cases of obtaining an unlawful benefit by an official, the following issues arise before the forensic examination: the ownership of the traces of hands left on objects of unlawful benefit (money, other material objects) by specific persons; the identity of samples of substance that marks the subject of unlawful benefit with the substance intended for such a mark, etc.

For accusing the head of the structural unit of the Ministry of Defense of Ukraine (hereinafter referred to as MDU) of offering illegal benefits³⁴ by transferring UAH 24

29 Справу щодо зловживань під час ліквідації аварії на шахті скеровано до суду / Національне антикорупційне бюро України. 08.06.2022. URL: <https://nabu.gov.ua/novyny/spravu-shchodo-zlovzhyvan-pid-chas-likvidaciyi-avariyi-na-shahti-skerovano-do-sudu> (date accessed: 22.07.2022).

30 Корупція на «Укрінмаш»: справу скеровано до суду / Національне антикорупційне бюро України. 07.06.2022. URL: <https://nabu.gov.ua/novyny/korupciya-na-ukrinmash-spravu-skerovano-do-sudu> (date accessed: 22.07.2022).

31 Зловживання в ОАСК: обвинувальний акт стосовно 11 осіб скеровано до суду / Національне антикорупційне бюро України. URL: <https://nabu.gov.ua/novyny/zlovzhyvannya-v-oask-obvynualnyy-akt-stosovno-11-osib-skerovano-do-sudu> (date accessed: 22.07.2022).

32 Про затвердження Інструкції про призначення та проведення судових експертиз та експертних досліджень та Науково-методичних рекомендацій з питань підготовки та призначення судових експертиз та експертних досліджень : наказ Мініюсту України від 08.10.1998 р. № 53/5 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z0705-98#Text> (date accessed: 22.07.2022).

33 Справу щодо підбурювання до підкупу ексдиректора ДБР скеровано до суду / Національне антикорупційне бюро України. URL: <https://nabu.gov.ua/novyny/spravu-shchodo-pidburyuvannya-do-pidkupu-eksdirektora-dbr-skerovano-do-sudu> (date accessed: 22.07.2022).

34 Спроба підкупу аудитора посадовцем Міноборони: скеровано до суду. URL: <https://nabu.gov.ua/novyny/sproba-pidkupu-audytora-posadovcem-minoborony-skerovano-do-sudu> (date accessed: 22.07.2022).

million to influence the results of the audit of the MDU, forensic (technical examination of documents, handwriting and author's research, video, sound recording), economic, construction and technical, evaluation and construction and commodity expertise are relevant.

The results of joint actions of NABU detectives and prosecutors of SAPO; withdrawal of HACC from the arrest of funds under criminal proceedings (therefore replenishment of the budget and strengthening of the defense capacity of Ukraine), for example: 6 million dollars. USA (attempt to bribe the management of SAPO and NABU)³⁵, UAH 146 million (bribe of the judge for a positive decision in the case on claim of the business entity³⁶), etc.

Currently, SBI employees, together with border guards, prevent the illegal crossing of the border by men of conscription age³⁷ and take filtration measures against citizens of the Russian Federation (using, in particular, a computer polygraph to obtain indicative information on the probability degree, completeness and information source reported by the interviewee, as well as

the interviewee's ideas about a particular event, etc.³⁸).

Criminalistic, economic (accounting and tax accounting; financial and economic activities), computer-technical examinations will be useful in the investigation of crimes of illegal withdrawal of funds of Belarusian and Russian businesses from Ukraine. Thus, a criminal group using forged passports of citizens of Ukraine registered fictitious commercial structures, which in only a few months of 2021-2022 transferred more than 110 million UAH to cash; during active war phase against Ukraine, intruders illegally withdrew the funds of counterparties from our state; they seized almost 1.5 million dollars. US dollars and 150 thousand euros, forged passports of citizens of Ukraine, seals and documents of fictitious enterprises, computer equipment with information on illegal activities³⁹.

SBI employees reported the suspicion to the head of one of the departments of the Starokostyantyniv City Council of Khmelnytskyi Oblast. Official negligence led to illegal privatization of 11.5 hectares of land of the Ministry of Defense of

35 6 млн дол. США, якими хотіли підкупити керівництво НАБУ і САП, перераховано на підтримку ЗСУ / Національне антикорупційне бюро України. 26.04.2022. URL: <https://nabu.gov.ua/novyny/6-mln-dol-ssha-yakymy-hotily-pidkupyty-kerivnyctvo-nabu-i-sap-pererahovano-na-pidtrymku-zsu> (date accessed: 22.07.2022).

36 146 млн грн одержали ЗСУ додатково за ініціативи НАБУ та САП / Національне антикорупційне бюро України. 18.05.2022. URL: <https://nabu.gov.ua/novyny/146-mln-grn-oderzhaly-zsu-dodatkovy-za-initsiatyvy-nabu-ta-sap> (date accessed: 22.07.2022).

37 Працівники ДБР вживають заходів щодо недопущення незаконного перетину кордону чоловіками призовного віку / Державне бюро розслідувань. 15.03.2022. URL: <https://dbr.gov.ua/news/pracivniki-dbr-vzhivayut-zahodiv-shhodo-nedopushhennya-nezakonnogo-peretynu-kordonu-cholovikami-prizovnogo-viku> (date accessed: 22.07.2022).

38 Про затвердження Інструкції URL: <https://zakon.rada.gov.ua/laws/show/z0705-98#Text> (date accessed: 22.07.2022)

39 ДБР заблокувало схему, через яку на рф та рб відмивалися мільйони доларів / Державне бюро розслідувань. 07.05.2022. URL: <https://dbr.gov.ua/news/dbr-zablokuvalo-shemu-cherez-yaku-na-rf-ta-rb-vidmivalisy-miljoni-dolariv> (date accessed: 22.07.2022).

Ukraine. According to the results of the forensic research, it was established that value of illegally transferred land is almost UAH 12 million⁴⁰.

During the war, HACС, ARMA and NAPC significantly intensified their anti-corruption activities. For example, during the period 24.02-15.07.2022, HACС investigating judges processed 1206 procedural documents at the stage of pre-trial investigation of criminal proceedings, including: 134 complaints against decisions, actions or inaction of the investigator, inquirer, prosecutor; 1045 petitions of the investigator, inquirer, prosecutor and other persons (in particular, 85 petitions for the application, change, extension of precautionary measure; 237 – for temporary access to things and documents; 522 – for solving other procedural issues during the pre-trial investigation). In addition, the panel of judges of the HACС partially satisfied the civil claim of the state represented by the SAP, recognizing the asset as unreasonable and charging the defendant with a part of the value of this asset in the amount of UAH⁴¹ 3,621,326. UAH 459,624,803 was allocated to the support of the Armed Forces of Ukraine and the needs of the state during martial law according to HACС court decisions⁴².

ARMA is *“central executive body with a special status that ensures the formation and implementation of state policy in the*

*field of detection and search for assets that may be seized in criminal proceedings or in the case of recognition of unjustified assets and their recovery in the State income and/or for the management of assets that may be seized in criminal proceedings or in the case of recognition of unjustified assets and their recovery in the state income or that are confiscated in criminal proceedings or recovered by a court decision in the state income as a result of their recognition as unjustified”*⁴³.

ARMA creation is due to the need of Ukraine to improve the processes for identifying and searching for assets illegally removed from the state as a result of corruption and other crimes, to introduce transparent and effective mechanisms for managing seized assets, as well as to fulfill Ukrainian obligations to the EU within the framework of the Action Plan for the liberalization of the visa regime, mandatory recommendations of the Organization for Economic Cooperation and Development, etc.

During the war, ARMA discovers and searches for assets in criminal cases related to armed aggression against Ukraine: Russian aircraft and cars, Belarusian trucks, etc. have already passed under its control.

ARMA actively cooperates with international organizations to search for the assets of persons involved in the Russian aggression. In particular, the

40 ДБР підозрює чиновницю Старокостянтинівської міськради в «оборудках» із землями Міноборони. URL: <https://dbr.gov.ua/news/dbr-pidozryue-chinovnicyu-starokostyantini-vskoi-miskradi-v-oborudkah-iz-zemlyami-minoboroni> (date accessed: 22.07.2022)

41 Статистичні дані роботи ВАКС від 24 лютого по 15 липня 2022 року / Вищий антикорупційний суд. 15.07.2022. URL: <https://hcac.court.gov.ua/hcac/pres-centr/news/1296134/> (date accessed: 22.07.2022).

42 Ibidem.

43 Про Національне агентство України з питань виявлення, розшуку та управління активами, одержаними від корупційних та інших злочинів : Закон України від 10.11.2015 р. № 772-VIII (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/772-19#Text> (date accessed: 22.07.2022).

Secretariat of Eng. Camden Asset Recovery Inter-agency Network (hereinafter referred to as CARIN) and the Interpol Global Network of Contact Points for Asset Tracking at the request of ARMA agreed to speed up the processing of requests from ARMA to identify and search for the assets of persons involved in hostilities in Ukraine ⁴⁴.

In particular, the draft Memorandum of Cooperation on the provision of international technical assistance EU Anti-Corruption Initiative (hereinafter referred to as EUACI) between ARMA and the project: *Support to Anti-Corruption Champion Institutions*, (hereinafter referred to as SACCI) provides:

- expert support;
- support of technical capacity (in particular, ensuring access to foreign registers, databases of enterprises, real estate, land cadasters and other assets);
- development and implementation of anti-corruption initiatives and measures in ARMA activities;
- other technical assistance for the implementation of anti-corruption initiatives.

Starting from 15.03.2022, NACP conducted an anti-corruption examination of a number of draft laws and government acts (for example: draft laws on amendments to the Code of Ukraine on Administrative Offenses regarding the introduction of administrative liability in the field of training and admission of drivers to drive vehicles; on compensation for damage and destruction certain categories of real estate objects as a result of hostilities, acts of terrorism, sabotage caused by the military aggression of the

Russian Federation; draft resolution of the Cabinet of Ukraine: *On Amendments to Certain Resolutions of the Cabinet of Ministers of Ukraine Regarding the Use of Subsoil*, etc.), that required the use of special knowledge. NACP actively works to identify and minimize corruption risks that have arisen due to the war (by conducting checks on: compliance with declarations of amounts of cash taken abroad by officials; delivery of humanitarian aid; admission to higher education institutions, etc.).

In the context under research, it is appropriate to consider Israeli police experience of the . From the standpoint of forensic examination, corruption cases differ little from the rest of criminal cases. Typically, Israel investigative agencies (police, tax, security) require the support of the following forensics services:

- document research laboratories (authenticity, specifics of handwriting, handwriting in handwritten documents);
- voice analysis and comparison groups;
- comparison groups of photo and video content;
- laboratories for detecting latent hand marks (contracts, receipts, currency, currency packaging, etc.);
- groups for analyzing computer information content and mobile phone content (messengers, voice messages, email, etc.).

Such forensic examinations do not fall within competence of the Criminalistics Department; they are carried out by *SIGnals Intelligence* (hereinafter referred to as *SIGINT*).

⁴⁴ Міжнародна діяльність АРМА в умовах війни / Агентство з розшуку та менеджменту активів. 09.06.2022. URL: <https://arma.gov.ua/news/typical/mijnarodna-diyalnist-arma-v-umovah-viyani> (date accessed: 22.07.2022).

Well-known researcher O. Yuhno states that “legal basis and the state of the criminogenic situation in the state and in the world prompt further scientific research in the use of modern achievements of telecommunication, information, computer, digital technologies and artificial intelligence in criminalistics, forensic examinations and during pre-trial investigation, since this requires the current state of development of science and technology, the which achievements are actively used by criminally inclined persons to commit new types of criminal offenses”⁴⁵.

Situational crime prevention focuses on the conditions of committing criminal acts and the circumstances of specific categories of crimes and pays special attention to the concentration of crime. Understanding how crimes are committed is crucial to situational crime prevention.

On July 10, 2022, the Law of Ukraine: *On Principles of State Anti-Corruption Policy for 2021-2025* entered into force⁴⁶, according to which the anti-corruption strategy is primarily designed to significantly reduce the level of corruption in areas that are considered as the most corrupt in Ukraine:

- customs and taxation;
- courts, Prosecutor’s Office and law enforcement agencies;
- State regulation of economy;
- construction and land relations;
- defense sector;
- healthcare;
- social protection.

The *Anti-Corruption Strategy for 2021-2025* states the following expected

strategic results to solve the issue of ensuring inevitability of responsibility for corruption:

“1) Hearing in criminal proceedings on corruption and corruption-related criminal offenses is carried out in compliance with continuity principle;

2) substantive jurisdiction of the High Anti-Corruption Court has been narrowed through increasing the value of the crime topic or the caused damage;

3) it is impossible to consider cases that belong to the substantive jurisdiction of the High Anti-Corruption Court, by other courts of first and appellate instances”⁴⁷.

Situational approach to preventing corruption crimes is a multi-step process that should find out where, when and in what way such crimes were committed. Forensic science often becomes a key element of the investigation of corruption crimes, because it is through the use of special knowledge that it is possible to calculate the amount of damage caused to the state, on which the possibility of prosecuting offenders and imposing an appropriate measure of punishment depends.

The of forensic examination purpose for prevention of corruption crimes is to assist the bodies of the anti-corruption system of Ukraine in answering the question: “Who?”, “What?”, “Where?”, “Why?”, “When?”, “How?” It is the expert conclusion that contributes to comprehensive, complete and objective research of case circumstances of and the

45 Южно О. Генезис і проблемні питання використання новітніх технологій та штучного інтелекту в криміналістиці, експертній діяльності й досудовому розслідуванні. *Теорія та практика судової експертизи і криміналістики*. 2021. Вип. 3 (25). С. 40–59. DOI: 10.32353/khrife.3.2021.04 (date accessed: 22.07.2022).

46 Про засади державної антикорупційної політики на 2021–2025 роки : Закон України від 20.06.2022 р. № 2322-IX. URL: <https://zakon.rada.gov.ua/laws/show/2322-20#Text> (date accessed: 22.07.2022).

47 Ibidem.

adoption of legal and substantiated court decisions.

Forensic expert practice analysis indicates that in Ukraine, during investigation of corruption offenses, the following forensic examinations are most often prescribed: computer and technical; materials, substances and products; video and sound recording; commodity experts; handwriting and linguistics; construction and technical and evaluation and construction; valuation and land; biological; psychological, etc. Using examinations, the following tasks are solved: ownership of handprints left on objects of illegal gain (money, other material objects) to specific persons; identification of performers of handwritten texts and signatures in documents on paper media; calculation of the cost of buildings and construction works; valuation of land plots; identity of samples of the substance with which the topic of illegal gain is marked and the substance used to apply such a mark; the identity of human voice samples and the voice on audio recording; determining market value of vehicles, tangible assets and other property; documentary justification of the size of the shortage or surplus of goods and material values and monetary funds; reasonableness of registration of bank operations for opening accounts, movement of funds in accounts, etc.⁴⁸

Conducting forensic examinations in cases of corruption is an effective means of determining the crime mechanism, identification of comparative samples

and traces of the suspected person, the subject of unlawful gain. Practical research and intellectual activity require a forensic expert to have developed, visual thinking, the ability to transform and systematize knowledge, model the research process, predict circumstances, as well as (according to Clause 2, Part 1, Article 13 of Law of Ukraine: *On Judicial Examination*) “indicate in the expert’s opinion the facts discovered in the course of the forensic examination, which are significant for the case and about which he was not asked questions”⁴⁹, because (according to clause 4, part 3, article 69 of the Criminal Procedure Code of Ukraine) forensic expert has the right “to state in the conclusion of the examination the information discovered during its conduct, which is important for the criminal proceedings and about which he was not asked any questions”⁵⁰. After all, forensic expert in his professional activity discovers facts and circumstances contributed (could contribute) to criminal offense commission and is able to formulate preventive recommendations that will enable the bodies of the anti-corruption system of Ukraine to determine factors of corruption risks.

Conclusions

In context of hostilities on the territory of Ukraine, with simultaneous activation of the European integration procedure, it is necessary to more actively introduce into practice of domestic

48 Про затвердження Інструкції URL: <https://zakon.rada.gov.ua/laws/show/z0705-98#Text> (date accessed: 22.07.2022).

49 Про судову експертизу : Закон України від 25.02.1994 р. № 4038-XII (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/4038-12#Text> (date accessed: 20.11.2022).

50 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/4651-17#Text> (date accessed: 20.11.2022).

anti-corruption bodies the EU requirements for functioning of the law enforcement system.

Since forensic science is the most qualified form of using special knowledge in criminal proceedings, it is advisable to increase the level of preventive activity of forensic institutions, fixing this at the legislative level, because the forensic expert during forensic examination reveals the actual data and circumstances that contributing (could contribute) to commission of corruption and corruption-related offenses. According to the results of the examination of the objects provided for, the forensic expert has the right to state in the conclusion the information revealed during forensic examination that is important for the criminal proceedings and which he was not asked for.

Preventive recommendations on circumstances and facts contributed (could have contributed) to crime commission, which can be given by forensic expert, will contribute to prevention of corruption and corruption-related offenses will provide significant assistance to state bodies in improving system of prohibitions, restrictions and requirements established to crime suppression, increase the effectiveness of mechanisms for preventing and resolving conflicts of interest.

As mechanisms for implementation of expert prevention, it is proposed to conduct a generalization of expert practice by research forensic institutions and provide the bodies of the anti-corruption ecosystem of Ukraine with information of a wide format which would contain an analysis and proposals for its practical implementation to prevent corruption and corruption-related offenses that should be fixed at legislative level.

Проблеми протидії злочинам корупційної спрямованості: судово-експертний аспект

Борис Геллер, Наталія Мартиненко

Проаналізовано діяльність спеціалізованих органів антикорупційної системи України та її механізмів. Метою статті є дослідити можливості й роль судової експертизи (зокрема, застосування спеціальних знань) для розслідування злочинів корупційної спрямованості та вдосконалення антикорупційного законодавства. Методологічним підґрунтям дослідження є аналіз ситуаційний (кейс-стаді). Судовий експерт, проводячи експертизу, виявляє фактичні дані й обставини, які сприяють (могли сприяти) скоєнню корупційних і пов'язаних із ними правопорушень. За результатами дослідження наданих на експертизу об'єктів судовий експерт викладає у висновку виявлені ним дані, які мають значення для кримінального провадження та щодо яких йому не було поставлено запитань. Профілактичні рекомендації про обставини та факти, що сприяли (могли сприяти) скоєнню злочину, які може надати експерт, допоможуть запобігти корупційним і пов'язаним із корупцією правопорушенням, сприятимуть державним органам у протидії корупції й підвищенні ефективності механізмів її запобігання. Як механізми реалізації експертної профілактики науково-дослідним установам судових експертиз запропоновано узагальнювати експертну практику й надавати органам антикорупційної системи України інформацію, яка містила б аналіз та пропозиції щодо попередження корупційних і пов'язаних із ними правопорушень, що необхідно закріпити на законодавчому рівні.

Ключові слова: органи антикорупційної системи України; корупційні ризики;

запобігання корупційним і пов'язаним із корупцією правопорушенням; антикорупційне законодавство; судова експертиза; розслідування злочинів корупційної спрямованості; висновок експерта.

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Forensic Veterinarian as a Subject of Procedural Legal Relations and Forensic Expert Activity

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The research paper suggests an extended definition for “forensic veterinarian”, consisting in the fact that this is an independent subject of procedural legal relations and forensic expert activity, with higher veterinary education (educational qualification level of specialist or master), who has undergone professional expert training, is certified and has gained qualification of a forensic veterinarian in the expert speciality 18.1 “Veterinary research”, on a professional basis possesses specific expertise and skills in the field of veterinary medicine, is entrusted to solve tasks of forensic veterinary examination and in accordance with legislation is involved in conduct of research on objects of forensic veterinary examination containing information about circumstances of criminal offense commission by using specific expertise as well as provides the expert conclusion or notifies about the impossibility of its provision. It is argued that special criteria for determining procedural status of a forensic veterinarian specify specifics of his professional activities in the system of forensic expert support of justice which is due to his specific veterinary expertise. Procedural criteria of the forensic veterinarian’s status reveal his role in the course of proceedings, in particular: his belonging to other (replaceable) participants in proceedings and performing auxiliary functions in it; has no personal interest in proceedings; has no material and legal interest in procedure outcome; information about the forensic veterinarian is entered into the State Register of Certified Forensic Experts (although this criterion is not mandatory).

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Keywords: forensic veterinary examination; forensic veterinarian; forensic expert; forensic expert activity; criteria for determining legal status of forensic veterinarian; specific veterinary expertise.

Research Problem Formulation

In 2019, at the initiative of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute», within the system of specialized forensic science institutions of the Ministry of Justice of Ukraine a new area of forensic science have been introduced: forensic veterinary examination, which initiation is due to latest requirements of judicial and investigative practice¹. And this, in turn, necessitates the development and justification of theoretical,

organizational, legal and praxeological foundations of the specified type of forensic examinations².

Specialized foreign scientific sources note rapid development of forensic veterinary examination and participation of veterinary medicine specialists in its conduct while investigation of offenses connected with specific objects related to this forensic examination: live animals, their carcasses, animal feed, etc.³.

A substantial issue in the field of theory and practice of forensic science is the doctrine of procedural status of the

- 1 Ключев О. М. Удосконалення експертного забезпечення правосуддя: теоретичні, правові та організаційні аспекти. *Теорія та практика судової експертизи і криміналістики*. 2019. Вип. 19. С. 102–117. DOI: 10.32353/khrife.1.2019.08 (date accessed: 08.09.2021) ; Яценко І. В., Дереча Л. М. Можливості судово-ветеринарної експертизи як нового виду судових експертиз. *Ibidem*. С. 550–567. DOI: 10.32353/khrife.1.2019.044 (date accessed: 08.09.2022).
- 2 Яценко І., Дереча Л., Казанцев Р. Новейшие научные и практические достижения и перспективы развития судебно-ветеринарной экспертизы групп животных в Украине. *Legea și Viața*. 2021. № 1. Vol. II. Pp. 94–99. URL: https://ibn.idsi.md/sites/default/files/imag_file/94-99_27.pdf (date accessed: 08.09.2022) ; Яценко І. В., Дереча Л. М., Парилловський О. І. Новітні наукові й практичні здобутки та перспективи розвитку судово-ветеринарної експертизи живих тварин в Україні. *Актуальні питання та перспективи розвитку судової експертизи та криміналістики* : мат-ли Міжнар. наук.-практ. конф. (Одеса, 03.09.2021). Одеса, 2021. С. 368–373.
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forensic expert in the context of Ukrainian⁴ legislation in force. The latter entails the list of duties and rights that the forensic expert is endowed with in his professional activities; guarantees of forensic expert activity; responsibility of the forensic expert for improper fulfilment of his duties and violation of legislation rules.

The issue concerning procedural status of a forensic expert of any expert speciality is regulated by the existing procedural legislation and departmental by-laws; however, peculiarities and specifics of procedural status of the forensic veterinarian in Ukrainian legislation have not been sufficiently outlined in specialized scientific literature, so they necessitate

research and justification, knowledge systematization and use in forensic expert practice.

Analysis of Essential Researches and Publications

Scientific and theoretical basis of research were research papers of leading Ukrainian scholars in the field of forensic science, in particular: A. V. Dudych⁵, V. Baraniak and O. Nesimka⁶, A. V. Halushka⁷, O. P. Uhrovetskyi⁸, E. B. Simakova-Yefremian⁹, L. V. Maksymiv¹⁰, A. O. Polianskyi, S. H. Hasparian, S. O. Andrenko, O. M. Shevtsova¹¹ and others, who paved the way for formation

- 4 Шепітько В. Ю. Проблеми використання спеціальних знань крізь призму сучасного кримінального судочинства в Україні. *Судова експертиза*. 2014. № 1. С. 11—18; Щербаковський М. Г., Щербаковская Л. П. Состязательные начала привлечения эксперта в уголовном судопроизводстве Украины. *Ученые записки Таврического национального университета им. В. И. Вернадского. Серия «Юридические науки»*. 2013. Т. 26 (65). № 1. С. 326—331; Шульженко А. В. Процесуальний статус і особливості процесуальної діяльності експерта й спеціаліста. *Науковий вісник Міжнародного гуманітарного університету. Серія «Юриспруденція»*. 2016. № 19. С. 132—134. URL: http://nbuv.gov.ua/UJRN/Nvmgu_jur_2016_19_36 (date accessed: 01.06.2022).
- 5 Дудич А. В. Вимоги, які пред'являють до особи судового експерта як учасника кримінального провадження. *Наше право*. 2015. № 1. С. 96—102. URL: http://nbuv.gov.ua/UJRN/Nashp_2015_1_19 (date accessed: 01.06.2022).
- 6 Бараняк В., Несімка О. Судовий експерт як суб'єкт судово-експертної діяльності. *Вісник Національного університету «Львівська політехніка»*. Серія: Юридичні науки. 2017. Вип. 876 (16). С. 244—248. URL: <https://ena.lpnu.ua:8443/server/api/core/bitstreams/791fdcd8-7464-4d58-b45d-994632543eb0/content> (date accessed: 01.06.2022).
- 7 Галушко А. В. Експерт як учасник кримінального провадження: теоретичний аспект. *Право і суспільство*. 2017. № 5. С. 237—243. URL: http://pravoisuspilstvo.org.ua/archive/2017/5_2017/part_1/42.pdf (date accessed: 01.06.2022).
- 8 Угровецький О. П. Регламентация правового статусу судового експерта в адміністративному судочинстві. *Науковий вісник Ужгородського національного університету. Серія «Право»*. 2017. Вип. 43. Т. 3. С. 229—234. URL: <https://journals.indexcopernicus.com/api/file/viewByFileId/496424.pdf> (date accessed: 01.06.2022).
- 9 Сімакова-Єфремян Е. Б. Про необхідність удосконалення законодавства щодо здійснення судово-експертної діяльності в Україні. *Теорія та практика судової експертизи і криміналістики*. 2019. Вип. 19. С. 118—129. DOI: [10.32353/khrife.1.2019.09](https://doi.org/10.32353/khrife.1.2019.09) (date accessed: 01.06.2022).
- 10 Максимів Л. В. Процесуальний статус експерта у кримінальному провадженні: окремі аспекти. *Порівняльно-аналітичне право*. 2020. № 2. С. 205—207. URL: <https://dspace.uzhnu.edu.ua/jspui/bitstream/lib/35561> (date accessed: 01.06.2022).
- 11 Полянський А. О., Гаспарян С. Г., Андренко С. О., Шевцова О. М. Щодо ролі судової експертизи в механізм захисту прав і свобод людини. *Права людини в Україні: минуле, сьогодення, майбутнє* : тези доп. учасн. Всеукр. наук.-практ. конф. (Харків, 10.12.2020). Харків, 2020. С. 170—172.

of theoretical, organizational, legal and praxeological basis of forensic expert activity.

Article Purpose

To develop and substantiate criteria for determining procedural status of the forensic veterinarian as a subject of forensic activity.

Research methods

Research methodological basis is a systematic approach conditioned by specifics of research paper topic and connected with application of general scientific and specific scientific methods, including:

- *analysis, synthesis, analogy*: to define the essence of categorical apparatus of the forensic veterinarian;
- *the formal logical method*, due to which logic of the *forensic veterinarian* definition is ordered as well as criteria for determining legal status of the forensic veterinarian;
- *the comparative legal method* helped to study the level of legal regulation of forensic expert activities and conformity of legal regulations with current state of expert activities regulation in Ukraine and abroad;
- *the logical-grammatical method* is aimed at discovering the etymological meaning of key terms and concepts concerning professional activity of a forensic veterinarian, as well as at interpreting and comparing individual categories and legal rules which facilitated determination of gaps and other shortcomings in the existing Ukrainian legislation and submission of proposals for its improvement;

- *the legal analysis method* was applied to analyze respective provisions of criminal, civil, economic and administrative procedural and criminal legislation and departmental regulatory acts of Ukraine on issues of forensic expert support of justice;
- *the system-structural method*: to outline the structure and disclose the content of criteria for determining legal status of a forensic veterinarian;
- *the sociological method* was used to find out existing problems in the researched field by interrogating judges, investigators, bodies of inquiry, animal rights activists and advocates on the basis of developed questionnaires;
- *the statistical method* is applied to process results of respondents' interrogation questionnaires;
- *the modelling method* came in handy while the development, prediction and determination of procedural status of the forensic veterinarian as a subject of forensic activity.

Main Content Presentation

The content of the *procedural status of the forensic veterinarian* concept in any type of court proceedings entails conceptual apparatus, the system of obligations, rights and guarantees of expert activities, prohibitions, restrictions and responsibility of a forensic expert for improper fulfilment of professional duties and violation of legislation; the only subject of forensic veterinary examination is the forensic veterinarian.

We analyzed the essence of the *forensic expert* definition in the national legislation of Ukraine and certain foreign countries. Etymologically speaking, the *forensic expert*

term means *experienced* (from lat. *expertus*: experienced, tested), *expert carrying out forensic examination*¹². In accordance with the European legal doctrine, the status of the forensic expert is defined as assistant judge in matters requiring application of specific expertise in the form of expert conclusion, and according to the Anglo-American system of law, his legal position is equated to the position of witness. Ukrainian legislation endows a forensic expert with separate legal personality as well as with independence in procedure with his own scope of rights, obligations, prohibitions, restrictions and legal liability, which objectively make him distinct from other procedure subjects (for example, a witness, a translator, etc.)¹³.

Art. 7 of the Law of Ukraine *On Judicial Examination* (hereinafter referred to as the specialized Law) notes that “*forensic expert activity is carried out by state specialized institutions, their territorial branches, forensic science institutions of communal ownership, as well as by forensic experts who are not employees at the specified institutions, and other specialists (experts) in respective areas of expertise in the manner and under conditions defined by this Law*”¹⁴. Therefore, there is a need to cover criteria for determining legal status of a forensic veterinarian as a subject of procedural legal relations and forensic expert activity and to word a definition for *forensic veterinarian*.

The *forensic expert activity* concept is broader in meaning than the *forensic examination* concept, which is the core of

this activity. One of the subjects of forensic expert activity is a forensic expert. The specialized Law does not include a definition for *forensic expert* term, though it is dedicated to issues of his legal status, in particular, Section II *Forensic expert*. However, it contains a certain amount of information on legal requirements for forensic expert personality (in particular, a forensic veterinarian) to ensure justice of Ukraine through conduct of independent, qualified, impartial and objective forensic examination aimed at using current achievements of science and technology. What is more, the existing legislation of Ukraine on judicial examination stipulates activity of forensic experts who are employees of state forensic science institutions, as well as of certified forensic experts not working at such institutions¹⁵.

Articles 10 and 11 of the specified Law set out general legal requirements for a forensic expert, in particular, he should possess required expertise to provide a conclusion on investigated issues, have a relevant University degree, educational and qualification level not lower than a specialist, undergo a corresponding training; he should be certified and qualified as a forensic expert in a certain speciality; the expert should also possess legal capacity, has no criminal record, imposed administrative penalty for committing corruption offense or disciplinary penalty in the form of deprivation of forensic expert qualification over the past year.

12 Академічний тлумачний словник української мови : в 11 т. ; за ред. І. К. Білодіда. Київ, 1970—1980. Т. 2. 1971. С. 462. URL: <http://sum.in.ua/s/ekspert> (date accessed: 19.06.2022).

13 Комзюк А. Т. Експерт в адміністративному судочинстві. *Право і Безпека*. 2009. № 2. С. 64—68. URL: http://nbuv.gov.ua/UJRN/Pib_2009_2_14 (date accessed: 19.06.2022).

14 Про судову експертизу : Закон України від 25.02.1994 р. № 4038-XII (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/4038-12#Text> (date accessed: 19.06.2022).

15 Пчелін В. Б. Організація адміністративного судочинства України: правові засади : монографія. Харків, 2017. 488 с.

The definition of the *forensic expert* term, which is outlined in the procedural legislation, is most comprehensively set forth in Art. 69 of the Criminal Procedure Code of Ukraine, namely: “An expert in criminal proceedings shall be an individual who has scientific, technical or any other special expertise, has the right under the Law of Ukraine ‘On Forensic Examination’ to conduct expert examination and who is assigned to examine objects, events and processes that contain information on circumstances under which a criminal offence was committed, and to provide an opinion on issues arising in the course of criminal proceedings and relating to the sphere of his knowledge.”¹⁶

Part 1 of Art. 72 of the Civil Procedure Code of Ukraine¹⁷, Part 1 of Art. 69 of the Code of Commercial Procedure of Ukraine¹⁸, Part 1 of Art. 68 of the Code of Administrative Proceedings of Ukraine¹⁹ define that “an expert can be a person who possesses specific expertise required to clarify corresponding circumstances of a case.”

In addition, certified forensic veterinarians who do not work in state specialized forensic science institutions but have relevant higher education, educational level not lower than a specialist, have been properly trained in state specialized institutions of the Ministry of Justice of Ukraine, are certified and obtained the qualification of a forensic expert in the speciality 18.1

Veterinary research, are involved in conduct of forensic veterinary examination.

Therefore, the *expert* term is used exceptionally in Ukrainian procedural legislation. In our viewpoint, it would be more expedient to use the *forensic expert* term (as in the specialized Law and the Draft Law On Forensic and Expert Activity), as the *expert* term may refer to any area of human activity, that is, the expert can be a person not specialized in forensic science (for example, an expert in military, political or economic issues). Instead, the *forensic expert* term clearly indicates that this is a specialist who is familiar with activities ensuring exclusively forensic expert support of justice, i.e. it specifies the subject field of his activity. That's why we suggest replacing the *expert* term with the *forensic expert* term in Ukrainian procedural legislation.

If we consider the Draft Law of Ukraine On Forensic and Expert Activity, we will notice that Part 1 of Art. 19 of the Draft Law On Forensic and Expert Activity and Self-Government of Forensic Experts No. 6284-2²⁰ dated 22.11.2021 (hereinafter referred to as Draft Law No. 6284-2) stipulates that a forensic expert carries out activities aimed at professionally conducting forensic examinations, has completed higher education in the respective area of expertise, undergone corresponding training, passed qualification examination and taken

16 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/4651-17#Text> (date accessed: 01.06.2022).

17 Цивільний процесуальний кодекс України від 18.03.2004 р. № 1618-IV (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/1618-15#Text> (date accessed: 01.06.2020).

18 Господарський процесуальний кодекс України від 06.11.1991 р. № 1798-XII (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/1798-12#Text> (date accessed: 01.06.2022).

19 Кодекс адміністративного судочинства України від 06.07.2005 р. № 2747-IV (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/2747-15#Text> (date accessed: 01.06.2022).

20 Проект закону про судово-експертну діяльність та самоврядування судових експертів від 22.11.2021 р. № 6284-2. URL: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?id=&pf3511=73258 (date accessed: 01.06.2022).

an oath of forensic expert, received an electronic digital signature with qualification certificate of a forensic expert in a certain speciality and has been entered into the State Register of Certified Forensic Experts. From our perspective, it would be expedient to add that a forensic expert (in addition to master's degree qualification of the second degree of higher education) may be qualified as *specialist*.

Article 1 of Draft Law No. 6284-2 defines the *expert* concept as “a person who, in compliance with requirements of current legislation, is entrusted with carrying out forensic examination” (clause 4)²¹ and *forensic expert* is “a person meeting requirements established by the present Law and other legal regulations, who has undergone specialized professional training, passed qualification exam and been entered into the State Register of Certified Forensic Experts of Ukraine” (clause 18)²².

Therefore, in the Draft Law analyzed above, the forensic expert definition does not specify that the forensic expert is empowered to solve forensic examination tasks; is involved in the manner prescribed by legislation; examines objects of forensic examination containing information on circumstances of offense commission by applying specific expertise; develops the expert conclusion or notifies about the impossibility of its compilation. We believe that such amendments to current definitions of a forensic expert would clarify his role, limits of his competence, and more fully disclose the essence of his activity.

Definitions for the *forensic expert* term in the procedural and draft legislation of Ukraine, *firstly*, vary in scope and legal structure, *secondly*, they include slightly different characteristics in various legal regulations, while this definition is lacking in the current specialized Law, what is irrational and unacceptable. What is more, analyzed characteristics of a forensic expert stipulated in the present legislation of Ukraine are outlined in various articles of the specialized Law, which causes inconvenience during their full application for solving tasks of court proceedings and forensic expert activities.

Our insight into the *forensic expert* definition shows that in this part of the legal status of the forensic expert, the indicated legal regulations require harmonization for the same interpretation of this term and its application regardless of the type of court proceedings and grounds for conducting a forensic examination, as well as for efficient implementation of the principles of forensic expert activity.

Clarification of the *forensic expert* definition in legal regulations of foreign countries indicates that the majority of them include a definition of this concept, but in a slightly different interpretation. Thus, clause 12 of Art. 1 of the Law of the Republic of Kazakhstan *On Forensic Expert Activity*²³ defines the *forensic expert* term as a person who has no personal interest in proceedings, possesses specific scientific expertise and meets other requirements stipulated by law, as well as the one who

21 Проект закону ... № 6284-2. URL: http://w1.c1.rada.gov.ua/pls/zweb2/web-proc4_1?id=&pf3511=73258 (date accessed: 01.06.2022).

22 Ibidem.

23 О судебно-экспертной деятельности : Закон Республики Казахстан от 10.02.2017 г. № 44-VI (с изм. по сост. на 01.07.2021). URL: https://online.zakon.kz/Document/?doc_id=37215312&pos=608;-42#pos=608;-42 (date accessed: 01.08.2022).

is entrusted with conduct of forensic examination. Article 12 of this Law states about competence of the Ministry of Justice of the Republic of Kazakhstan, namely, about the development and approval of: requirements for forensic research methods; rules for compilation, maintenance and use of the State Register of Methods of Forensic Expert Researches; requirements for standards and specially equipped premises for conducting forensic examination; rules of qualification training, certification and advanced training of forensic experts; rules for compilation, maintenance and use of the State Register of Forensic Experts, etc.

Article 20 of the Law outlines required qualifications for a forensic expert, in particular, he must comply with the following qualification requirements: have a University degree as well as qualification of a forensic expert confirmed by certificate of qualification which empowers an expert with the right to conduct a certain type of forensic examination; should be certified.

In the event of reasonable doubts concerning proficiency of a forensic expert, he undergoes extraordinary evaluation.

In conformity with the Law of the Kyrgyz Republic *On Forensic Expert Activity*²⁴, a forensic expert is a person who has no personal interest in proceedings outcome and possesses specific expertise in the field of science, technology, art or craft, who is entrusted with carrying out forensic examination according to the legislation of the Kyrgyz Republic. However, this definition cannot be viewed as complete, since there is no mention of relevant

higher education, professional expert training, certification and acquisition of qualification of a forensic expert in a corresponding expert speciality. At the same time, Article 14 regulates that a forensic expert can be state or non-state forensic expert or another person who possesses specific expertise. A forensic expert is an employee of forensic science organization that carries out forensic examination during fulfilment of official duties. A person involved in a case as a forensic expert, who is not a member of forensic organization staff, conducts forensic examination at the request of the body (person) who ordered it and in compliance with the Kyrgyz Republic legislation. Persons with outstanding or unexpunged criminal records cannot be involved as forensic experts. Within three years from the date of occurrence of relevant legal circumstances, a forensic expert cannot be a person whose criminal record has been withdrawn or repaid in conformity with the procedure stipulated by law; dismissed from civil service, prosecutor's office, other law enforcement agencies, courts, forensic science organizations for commission of disciplinary offense; is deprived of the certificate of competence to engage in forensic expert activities or validity of the certificate of competence to engage in forensic expert activities has been suspended. While investigation of case circumstances, forensic expert studies only those issues which relate to subject matter of forensic examination assigned to him and important for expert conclusion provision. Bodies of inquiry, investigation, court and parties in court proceedings have the right to address a forensic expert only in matters concerning forensic

24 О судебно-экспертной деятельности : Закон Кыргызской Республики от 24.06.2013 г. № 100. URL: <http://cbd.minjust.gov.kg/act/view/ru-ru/203908> (date accessed: 01.08.2022).

examination entrusted to him. As stated in the Kyrgyz Republic legislation, a forensic expert can be interrogated exceptionally about the expert conclusion provided by him as well as research he has personally performed. It is forbidden to interrogate a forensic expert before provision of the expert conclusion.

Clause 12 of Art. 1 of the Law of Turkmenistan *On Forensic Expert Activity*²⁵ also provides a definition for the *forensic expert* concept, under which this is a person who meets requirements of the specified Law and whom the body conducting criminal procedure, court or body empowered to consider cases on administrative offenses, a prosecutor, a notary, entrusted to conduct forensic examination in accordance with the procedure stipulated by Turkmenistan legislation. However, this definition does not imply participation of a forensic expert in civil proceedings, and innovation of this Law of Turkmenistan (compared to the legislation of other countries) is that a notary may also be the subject of ordering forensic examination. Professional and qualification requirements for a forensic expert in Turkmenistan are set out in Art. 12 of the aforementioned Law: a forensic expert should possess specific expertise (Part 1); have higher education (Part 4) as well as qualification of a forensic expert confirmed by qualification certificate for the right to conduct a certain type of forensic examination, should be certified by evaluation commission of forensic examination bodies and

entered in the State Register (Part 5); should be a Turkmenistan citizen (Part 6). Also, this article of the Law notes that forensic examination may be entrusted to employees of forensic examination bodies; to natural persons engaged in forensic expert activities on the basis of a license for conducting forensic expert activity; to other persons (Part 2) on one-off basis. Separately, it is argued that persons who start working in forensic examination bodies must undergo specialized professional training which ends with qualifying exam (Part 7). According to Art. 95 of Turkmenistan Code of Criminal Procedure²⁶, an expert can be a person who has no personal interest in proceedings outcome and possesses specific expertise required for conducting forensic examination and providing the expert conclusion. Analyzing this definition, it should be stressed that it is incomplete, as in order to acquire the status of a forensic expert, it is not enough to possess specific expertise: it is also vital to pass evaluation, acquire qualification of a forensic expert in a particular expert speciality and have powers to provide the expert conclusion (or notify of the impossibility of its compilation).

The Law of the Republic of Uzbekistan *On Forensic Expertise*²⁷ defines a forensic expert as follows: a natural person who possesses specific expertise in the field of science, technology, art or craft, for expert conclusion provision and is assigned as a forensic expert according to the

25 О судебно-экспертной деятельности : Закон Туркменистана от 08.11.2014 г. № 137-V (с изм.). URL: <http://www.turkmenbusiness.org/content/zakon-turkmenistana-o-sudebno-ekspertnoi-deyatelnosti> (date accessed: 01.08.2022).

26 Уголовно-процессуальный кодекс Туркменистана от 18.04.2009 г. URL: <http://www.turkmenbusiness.org/node/124> (date accessed: 01.08.2022).

27 О судебной экспертизе : Закон Республики Узбекистан от 01.06.2010 г. № ЗРУ-249 (с изм. и доп.). URL: <https://lex.uz/ru/docs/1633100> (date accessed: 01.06.2022).

established manner. Art. 10 of this Law stipulates that state forensic expert, an employee of another organization or other natural persons may be a forensic expert. An employee of another organization conducts a forensic examination in order to discharge mandate given to this organization by body (person) that assigned him. Another natural person who is involved in case as a forensic expert and who is not a member of the staff of state forensic science institution carries out forensic examination in order to discharge the mandate of the body (person) that assigned him.

In conformity with the Law of the Republic of Azerbaijan *On Forensic Expert Activity*²⁸ forensic expert (expert) is a person entrusted with conduct of forensic examination, who possesses required expertise in specific issues related to forensic science subject and has no personal interest in proceedings outcome, the one who obtained a forensic expert's certificate. Article 11 notes that a citizen of the Republic of Azerbaijan who has higher education and has undergone relevant professional training in a particular expert specialization, can become an expert. Depending on specialization and level of training, experts are awarded corresponding qualifications. Experts of the forensic science institution are granted the expert title in the manner envisaged by the Republic of Azerbaijan legislation for employees of relevant executive

bodies that they are subordinated to, taking into account the position they hold, professional abilities and work experience. A similar definition of the term *expert* is contained in Art. 97 of the Criminal Procedure Code of the Republic of Azerbaijan²⁹.

Analyzing the Armenian legislation on forensic examination, it should be emphasized that the basic Law on forensic examination is still lacking in this country. At the same time, the forensic expert concept and its procedural status are comprehensively outlined in Art. 85 of the Criminal Procedure Code of the Republic of Armenia³⁰, where it is stated that an expert is a person, personally disinterested in the criminal case, appointed, upon his/her consent, by a body, conducting the criminal trial, or upon its demand, by the head of expertise institution or invited by a party for the conduct of research of the materials of the case with the utilization of special knowledge in sciences, technology, arts, crafts and for drawing a conclusion on that basis. Also, the expert may be appointed from among the persons, offered by the participant of the trial. In addition, the expert shall possess sufficient special skills and knowledge of science, technology, arts or crafts (Part 2 of Article 85 of the Criminal Procedure Code of the Republic of Armenia)³¹.

Analysis of Georgian legislation indicates that the law on forensic examination has not been adopted in this country. Individual criteria for

28 О судебно-экспертной деятельности : Закон Азербайджанской Республики от 18.11.1999 г. № 758-ІГ (с изм. и доп.). URL: http://base.spininform.ru/show_doc.fwx?rgn=2704 (date accessed: 01.08.2022).

29 Уголовно-процессуальный кодекс Азербайджанской Республики от 14.07.2000 г. № 907-ІQ (с изм. и доп. по сост. на 08.07.2022). URL: https://continent-online.com/Document/?doc_id=30420280 (date accessed: 01.09.2022).

30 Уголовно-процессуальный кодекс Республики Армения от 27.07.2021 г. № ЗР-306 (с изм. и доп.). URL: https://base.spininform.ru/show_doc.fwx?rgn=143021 (date accessed: 01.09.2022).

31 О внесении дополнений и изменений в Уголовно-процессуальный кодекс Республики

forensic expert and his procedural status are contained in Articles 51–52 of the Criminal Procedure Code of the Republic of Georgia. For example, according to Art. 51, an expert shall be assigned all rights and obligations of a witness; an expert shall be impartial regardless of the party that has summoned him/her; it shall be impermissible to conduct an expert examination to prove the reliability of a witness. However, there is no³² clear definition of the *forensic expert* concept in Georgian procedural legislation.

Art. 9 of the Law of the Republic of Tajikistan *On State Forensic Examination* notes that a forensic expert is an employee of state forensic science institution who conducts state forensic examination while fulfilling official duties³³. In our opinion, the *forensic expert* definition in the Tajik legislation has the same meaning as in the outlined legislations of the Republic of Azerbaijan and the Republic of Uzbekistan.

As stated in Art. 84 of the Criminal Procedure Code of the Republic of Lithuania, a forensic expert is a person who possesses specific expertise and provides conclusion on investigated issues and who is included in the list of forensic experts of the Republic of Lithuania. Experts who are not included in this list as well as forensic experts from the European Union country with which Lithuania has

an agreement on legal assistance can be involved as a forensic expert.

The legislation of the Republic of Moldova on forensic expert activity contains individual rules in the Criminal Procedure Code of the Republic of Moldova and in the Law *On Forensic Examination, Scientific-Technical and Forensic-Medical Research*. Part 1 of Art. 88 of the Criminal Procedure Code of the Republic of Moldova³⁴ gives the following definition: an expert is a person assigned to carry out research in cases stipulated by this Code, who has no personal interest in criminal proceedings and who provides the expert conclusion on the basis of specific expertise in science, technology, art and other fields. The Law *On Forensic Examination, Scientific-Technical and Forensic-Medical Research*³⁵ does not cover the forensic expert definition, however, Art. 8 specifies requirements for a forensic expert under which he can be a person who: has legal capability; has a University degree; has undergone relevant training in a certain field of forensic science and is qualified as a forensic expert; possesses specific expertise in certain fields of science, technology, medicine, art or other areas of human activity required for expert conclusion provision; is certified as a forensic expert of a certain field; has no criminal record; is a respected specialist,

Армения : Закон Республики Армения от 01.07.2020 г. № ЗР-344. URL: https://base.spinform.ru/show_doc.fwx?rgn=126809 (date accessed: 01.09.2022).

32 Уголовно-процессуальный кодекс Грузии от 09.10.2009 г. № 1772. URL: <https://matsne.gov.ge/ru/document/view/90034?publication=144> (date accessed: 01.09.2022).

33 О государственной судебной экспертизе : Закон Республики Таджикистан от 25.06.2005 г. № 102 (с изм. и доп.). URL: https://base.spinform.ru/show_doc.fwx?rgn=9038 (date accessed: 01.06.2022).

34 Уголовно-процессуальный кодекс Республики Молдова от 14.03.2003 г. № 122-XV (с изм. и доп. по сост. на 21.07.2022). URL: https://www.legis.md/cautare/getResults?doc_id=17324&lang=ru (date accessed: 01.09.2022).

35 О судебной экспертизе, научно-технических и судебно-медицинских исследованиях : Закон Республики Молдова от 23.06.2000 г. № 1086 (с изм. и доп.). URL: https://www.legis.md/cautare/getResults?doc_id=65637&lang=ru (date accessed: 01.09.2022).

carries out his activities within state forensic expert institution or is certified in accordance with the established manner as a private forensic expert and included in the State Register of Certified Forensic Experts.

Therefore, the analysis of legislation on forensic expert activity in near abroad countries demonstrates that the legal status of a forensic expert in Uzbekistan and Moldova is regulated to a certain extent (in particular, the *forensic expert* definition: both in the basic legislation on forensic examination and in criminal procedural law). On the other hand, in the legislation of Armenia and Georgia, there are no basic legal regulations on forensic examination, so the *forensic expert* definition with varying degree of detail is outlined in by-laws. What is common in the legislation on forensic expert activity in all these countries is that the forensic expert belongs to other participants in proceedings or to persons contributing to court proceedings.

The analysis of the *forensic expert* concept in the legal system of Anglo-American law, as well as participation of a forensic expert in criminal procedure point to the fact that, according to *The White Book*, forensic experts are persons who possess specific expertise and skills, who are involved in proceedings by prosecutors fiscal with permission of the Royal Council³⁶ and who fulfil the following functions while court proceedings: generalization of expert experience, experience of other

researchers as well as data from reliable sources; application of statistical research methods; provision of one's own conclusion; capability to exercise powers of the defense counsel³⁷. Under English law, it is not necessary for a forensic expert to possess formal qualifications in a particular field of activity (as stipulated by the procedural legislation of Ukraine and other near abroad countries), however, his experience in a certain field is checked by parties to proceedings during interrogation by asking him questions confirming or speaking against his experience as well as reliability and relevance of his application of modern research methods.

Polish legislation does not cover the definitions of *expert* and *forensic examination*, a forensic expert is conditionally equated to *external means of professional knowledge*, i.e. a court / prosecutor involves a forensic expert only if there is a need to apply specific expertise in a particular field of science. The status of a forensic expert is that he acts as a *scientific judge, court assistant, witness, independent participant in court proceedings*³⁸.

Forensic expert activity in Germany is grounded on the fact that procedural status of a forensic expert is determined by Federal Court of Justice of Germany, in particular, it authorizes him on behalf of the state to implement forensic expert activities in a certain field of science, art or craft in compliance with the law; in return, the forensic expert provides

36 Коновалова В. О., Шепітько В. Ю. Юридична психологія : підручник. 2-ге вид., перероб. і доп. Харків, 2008. 240 с. URL: https://shron1.chtyvo.org.ua/Konovalova_Violetta/Yurydychna_psykholohiia.pdf?PHPSESSID=2odmj99v7m77m525bbo3a8jgt7 (date accessed: 01.09.2022).

37 Egglestone R. Evidence, Proof and Probability. 2nd ed. London, 1983. 274 p.

38 Дифенюк О. М. Досвід Польщі стосовно участі судового експерта у кримінальному провадженні. *Науковий вісник Львівського державного університету внутрішніх справ. Серія юридична*. 2018. Вип. 1. С. 240–249. URL: <http://dspace.lvduvs.edu.ua/handle/1234567890/1229> (date accessed: 01.09.2022).

the court with the expert conclusion that is based upon specific expertise, or establishes or evaluates facts on the basis of specific expertise (§ 75 of the Criminal Procedure Code of the Federal Republic of Germany). Private forensic experts are considered trustworthy by society in Germany. Therefore, the procedural legislation of the Federal Republic of Germany defines a forensic expert as assistant judge³⁹.

In accordance with special law of Austria, forensic experts must have at least five years of practical experience, possess specific expertise in a certain area of forensic science and criminalistics, gain a certificate or pass an exam for independent activities⁴⁰.

In the Netherlands, a forensic expert is a person who possesses required specific expertise for expert conclusion provision and who has been appointed by a court or jury relying on recommendations from forensic laboratories. The expert conclusion is not a mandatory source of evidence for the court. To assess competence of a forensic expert during trial, the court reviews what research

methods the forensic expert applied, how credible they are, etc.⁴¹.

According to Art. 144–147 of the Criminal Procedure Code of Bulgaria, forensic experts who possess special knowledge in the field of science, art or technology, conduct forensic examinations and are appointed by the court or pre-trial investigation body⁴².

In forensic expert activity of Finland and Sweden, an expert is recognized as a person who carries out forensic examination and possesses specific expertise, skills and relevant higher education for this purpose. According to the procedural legislation, a forensic expert's status in these countries is equal to the status of witness⁴³.

In Sweden, forensic experts are empowered with the right to participate in trial to save the court's time for investigating and evaluating case circumstances, therefore they are also called "judges of fact". In the US regulatory document *The Federal Rules of Evidence*, the *expert witness* concept is set out as following: this is an expert whose opinion is taken into consideration as

39 Strafprozeßordnung (StPO) der BRD (in der Fassung der Bekanntmachung vom 7. April 1987 (BGBl. I S. 1074, 1319), die zuletzt durch Artikel 5 des Gesetzes vom 23. Juni 2011 (BGBl. I S. 1266) geändert worden ist). URL: <http://www.gesetze-im-internet.de/stpo> (date accessed: 01.09.2022).

40 Kundmachung der Bundesregierung vom 9. Dezember 1975 über die Wiederverlautbarung der Strafprozeßordnung 1960. URL: http://www.wipo.int/wipolex/ru/text.jsp?file_id=235569 (date accessed: 01.09.2022).

41 Гузела М., Кацнір В. Зарубіжний досвід організації судово-експертної діяльності в процесі здійснення кримінального переслідування. *Вісник Національного університету «Львівська політехніка»*. Серія: Юридичні науки. 2018. № 906. С. 129–135. URL: <http://science.lpnu.ua/sites/default/files/journal-paper/2019/sep/18385/21.pdf> (date accessed: 01.09.2022).

42 Репешко П. І. Судовий експерт: співвідношення процесуального статусу та професійної діяльності. *Advanced Technologies of Science and Education : XIV Міжнар. наук. інтернет-конф.* URL: <http://intkonf.org/repeshko-pi-sudoviy-ekspert-spivvidnoshennya-protseualnogo-statutu-ta-pofesiyanoi-diyalnosti/> (date accessed: 01.09.2022).

43 Авдеева Г. К. Проблемы гармонизации законодательства Украины у галузі судової експертизи із законодавством країн Європейського Союзу. *Правова доктрина – основа формування правової системи держави* : мат-ли Міжнар. наук.-практ. конф., присвяч. 20-річчю НАПрН Укр. та обговор. п'ятитом. моногр. «Правова доктрина України» (Харків, 20–21.11.2013). Харків, 2013. С. 634–637.

evidence by the court. In conformity with the legislation of Slovakia, Portugal and Austria, police officers also can be forensic experts, unless they fulfil functions of police officers⁴⁴.

Therefore, the analysis of the *forensic expert* concept in legislation of foreign countries demonstrates that a paramount principle of forensic expert activity is independence of the forensic expert. The priority is not based on departmental affiliation of an expert but on his specific expertise required to solve tasks of justice addressed to him. The legislation of foreign countries is structured in such a way that presupposes equal opportunities for activities of public and private forensic experts. Effectiveness of expert activities is ensured through standardization of forensic examinations, certification of their scientific and methodological support and also depends on competence of forensic experts as well as on accreditation of forensic laboratories.

In scientific literature, controversy around the *forensic expert* concept is due to its ambiguity, at the same time the *forensic veterinarian* concept is only being formed, as theoretical research in this area of forensic expert activity is at the stage of development in Ukraine.

Let's take into account viewpoints of researchers on the meaning of the *forensic expert* concept in order to develop our vision of the *forensic veterinarian* definition on this basis. A. V. Dudych⁴⁵ concluded that the characteristics of

the profession of forensic expert as a subject of forensic expert activity can be classified into general and specific. General features include social character, purposefulness, planning and systematic nature of implementing professional activities by a forensic expert. According to the researcher, specific features of professional activity of a forensic expert include: legal nature of professional activity; relative independence in determining and choosing types and methods of research, technical methods and means during conduct of forensic examinations; research nature of forensic examination; verifiability of forensic expert activity; his initiative and ability to go beyond expert tasks; constructive nature of professional activities; relation between individuality and collegiality; interest in results of his activities.

We believe that the characteristics of profession of a forensic expert as a subject of forensic expert activity provided by A. V. Dudych are to a greater extent not features of the profession, but principles of forensic expert activity.

It is more expedient to divide the criteria of the legal status of a forensic expert as a subject of expert activity into special and procedural, as the special concept entails a wider range of forensic expert activities: it is interpreted as intended exclusively for someone; that one that has special purpose; which somehow stands out from the rest; specific; which is marked by a greater than usual degree of manifestation⁴⁶.

44 Скрипник М. Мировой опыт в судебно-экспертной деятельности / Сайт Экспертно-дослідної служби України. URL: <https://ua-expert.com/news/svitoviy-dosvid-u-sudovoekspertnij-diyalnosti/> (date accessed: 01.09.2022).

45 Дудич А. В. Поняття судового експерта як учасника кримінального провадження. *Наше право*. 2014. № 6. С. 138–143. URL: http://nbuv.gov.ua/UJRN/Nashp_2014_6_25 (date accessed: 01.06.2022).

46 Академічний тлумачний словник української мови Т. 9. 1978. С. 501. URL: <http://sum.in.ua/s/specialjnyj> (date accessed: 01.08.2022).

From our perspective, special criteria of the procedural status of a forensic veterinarian describe in detail the specifics of his professional activities within the system of forensic expert justice support, which is due to his specific veterinary expertise. Procedural criteria for the status of a forensic veterinarian determine his place in proceedings during forensic expert support of justice.

A. V. Dudych⁴⁷ proposes that the *expert* concept should be understood as a person who has no personal interest in proceedings outcome, who, on a professional basis possesses required specific expertise, skills and practical abilities to solve expert tasks, who was assigned as an expert in the manner envisaged by law and who accepted objects to be studied in order to conduct research and provide the expert conclusion on issues arising during procedural proceedings and relating to the field of his expertise.

O. P. Uhrovetskyi⁴⁸ defines a forensic expert as a subject of administrative procedural legal relations: a person who meets requirements defined by the legislation on judicial examination; who is a participant in administrative proceedings and who is endowed with procedural powers enshrined at the legislative level. According to the researcher, implementation of forensic expert's powers is aimed at clarifying circumstances essential for resolution of public-law dispute and requires the use of specific expertise in the relevant field of science, technology, crafts, etc.

In our opinion, advancement of Ukrainian legislation concerning the status of a forensic expert during his fulfilment of professional duties (regardless of the type of court proceedings) requires a clear wording for the definition of the *forensic expert* concept in the specialized Law: with reference to this Law as a blanket rule of procedural legislation (Part 1 of Article 69 of the Criminal Procedure Code of Ukraine, Part 1 of Article 69 of the Civil Procedure Code of Ukraine, Part 1 of Article 68 of the Code of Commercial Procedure of Ukraine, Part 1 of Article 68 of the Code of Administrative Proceedings of Ukraine), which will promote unambiguity in its interpretation, clarity and ease of perception, as well as contribute to the efficiency of application.

Having studied domestic legislation, research papers, results of generalization of investigative and judicial practice, and official statistics, Ye. V. Kovalevska worded the definition for *medical examiner*: this is *"a person who has no personal interest in proceedings outcome and has higher medical education, is qualified as a 'doctor' in a certain speciality and possesses professional skills, who is certified in accordance with the procedure stipulated by legislation, possesses required medical expertise, has the right, in accordance with the Law of Ukraine 'On Judicial Examination', to conduct forensic medical examination and provide the expert conclusion on issues arising in the course of criminal proceedings and relating to the area of expertise; and in case of violation of procedural requirements, he is liable according to the law."*⁴⁹

47 Дудич А. В. Ор. cit. URL: http://nbuv.gov.ua/UJRN/Nashp_2014_6_25 (date accessed: 01.06.2022).

48 Угровецкий О. П. Ор. cit. URL: <https://journals.indexcopernicus.com/api/file/viewByFileId/496424.pdf> (date accessed: 01.06.2022).

49 Ковалевська Є. В. Використання спеціальних медичних знань під час розслідування злочинів : автореф. дис. ... канд. юрид. наук. Київ, 2018. 27 с. URL: http://ir.librarynmu.com/bitstream/123456789/997/1/Kovalevska_Aftoreferat.pdf (date accessed: 01.06.2022).

Therefore, we suggest changing the name of Art. 1 of the specialized Law to *Definition of main terms* and setting it out in the wording proposed below. The definition of *forensic examination* in Art. 1 of the specialized Law should be set out in its current wording, but outlined in clause 1; and clause 2 should be amended with definition of a *forensic expert* in the following wording: “*Forensic expert is an independent subject of procedural legal relations and forensic expert activity, who has relevant higher education (specialist’s or master’s degree); has undergone professional expert training; is certified and qualified as a forensic expert in the corresponding expert speciality; on a professional basis possesses specific expertise and skills in the relevant field; is empowered to solve tasks of forensic examination in a particular expert speciality and involved in the manner prescribed law; examines objects of forensic examination containing information about circumstances of offense commission by using of specific expertise; provides the expert conclusion or notifies about the impossibility of its compilation.*”

In any case, the forensic expert concept is inextricably linked to his status as a procedural person while forensic expert support of justice. The *status* concept is interpreted as a situation, condition⁵⁰. In our view, the forensic expert status (in particular, a forensic veterinarian) should be understood as the legal status consisting of rights, obligations, prohibitions, restrictions, responsibilities and is reflected in his interaction with other subjects of forensic expert activity,

authorized bodies or persons, as well as with participants in proceedings.

The legal status of a forensic (in particular, a forensic veterinarian) expert consists of objective, really existing elements. If they are identified, systematized and analyzed in aggregate, it is possible to comprehensively and thoroughly study this phenomenon. The study of the legal status of a forensic veterinarian as an integrated system, among the structural elements of which one can single out special and procedural elements and determine the nature of relations while his fulfilment of professional functions. A forensic veterinarian acquires procedural status when he is assigned by the court or when he is involved by a party to the proceedings in compliance with Art. 243 of the Criminal Procedure Code of Ukraine, Part 2 of Art. 72 of the Civil Procedure Code of Ukraine, Part 2 of Art. 69 of the Code of Commercial Procedure of Ukraine and Part 2 of Art. 68 of the Code of Administrative Proceedings of Ukraine.

Generalization of research papers by domestic scientists who studied into the issue of the legal status of a forensic expert in various types of court proceedings, current regulatory framework and the Draft Law, gives us grounds to generalize criteria for defining a forensic veterinarian, given in fig. 1. To properly understand and disclose the content of features of this concept in law enforcement and forensic expert activities, it is advisable to thoroughly analyse them which will help to word a detailed definition for the *forensic veterinarian* concept.

50 Академічний тлумачний словник української мови Т. 9. 1978. С. 671. URL: <http://sum.in.ua/s/status> (date accessed: 01.08.2022).

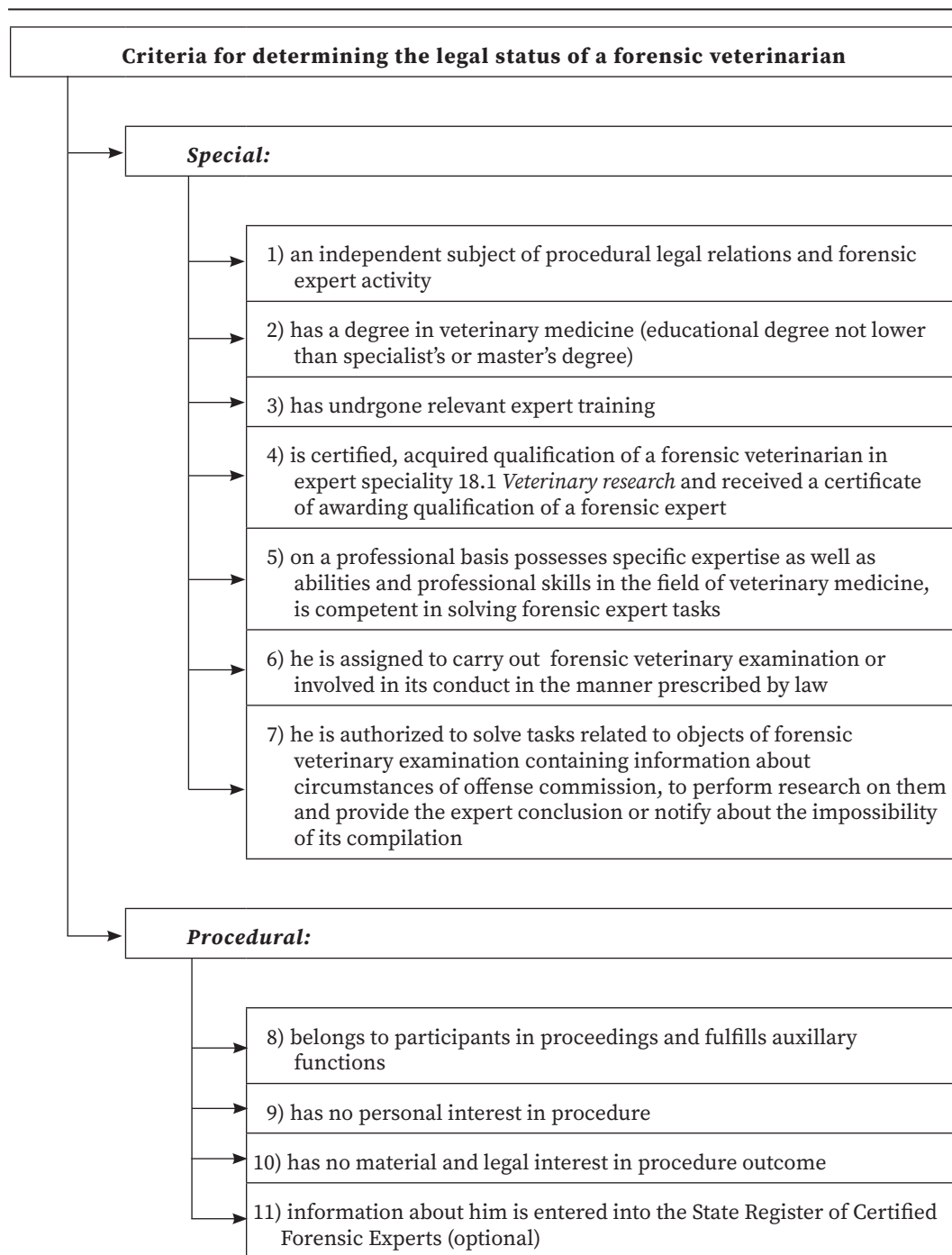


Fig. 1. Flowchart *Criteria for determining legal status of a forensic veterinarian*

Forensic veterinarian is an independent subject of procedural legal relations and forensic expert activity. As stated in Art. 7 of the above-mentioned Law, forensic expert activity is carried out by state specialized institutions, their territorial branches, forensic science institutions of communal ownership, as well as by forensic experts who are not employees of the specified institutions, and other specialists (experts) in respective areas of expertise.

Art. 13 of the Draft Law On Forensic and Expert Activity No. 6284 (hereinafter referred to as *Draft Law 6284*) dated November 5, 2021, sets out that subjects of forensic expert activity are forensic experts, forensic science institutions, heads of forensic science institutions, state regulation agencies, the Coordination Council on Issues of Forensic Examination, bodies of the Association of Private Forensic Experts of Ukraine⁵¹.

Thus, considering the aforementioned definitions, one of the subjects of forensic expert activity is a forensic (in particular, a forensic veterinarian) expert. The *expert* concept is outlined in Art. 69 of the Criminal Procedure Code of Ukraine, Art. 72 of the Civil Procedure Code of Ukraine, Art. 69 of the Code of Commercial Procedure of Ukraine, Art. 68 the Code of Administrative Proceedings of Ukraine.

Since the forensic veterinarian is the subject of legal relations, features of the subject are applied to him: the expert should also possess legal capacity, capability to act and delictual dispositive capacity.

The specialized Law in Art. 10 stipulates conduct of forensic (in particular, forensic veterinary) examinations by both forensic experts working at state specialized institutions and experts who are certified but are not employees of these institutions. According to their procedural status,

they must meet the same requirements, in particular, have equal rights and obligations; however, organizational framework of their activities varies.

The forensic veterinarian of state forensic science institution is a member of the staff of state forensic science institution, he is its employee, carries out forensic veterinary examinations while fulfilling official duties, can perform research on the development of new and advancement of classic methods of forensic research, implements other types of forensic activities. A certified forensic veterinarian who does not work at state specialized forensic science institutions (private forensic expert) independently carries out forensic expert activities in order to conduct forensic veterinary examination in a professional manner. Special requirements are applied to such forensic experts (in compliance with Article 10 of the specialized Law) including: he has a degree in veterinary medicine, educational and qualification level not lower than a specialist (master), has undergone expert training in the expert speciality 18.1 *Veterinary research* in state specialized institutions of the Ministry of Justice of Ukraine, as well as availability of certified, certification qualification of a forensic expert in the above-mentioned expert speciality and independently conduct forensic veterinary examinations. At the same time, Ukrainian legislation does not limit rights of forensic veterinarians who do not work in state specialized forensic science institutions in the development, testing and the ability and right to implementation of expert methods.

Procedural status of the forensic veterinarian is primarily due to the fact that he is an independent participant in proceedings, that is, he acts at the stage of pre-trial investigation and while court

51 Проект закону про судово-експертну діяльність від 05.11.2021 р. № 6284. URL: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=73154 (date accessed: 12.01.2022).

proceedings (trial) independently of other subjects of forensic expert activity. His main role (compared to the rest of participants in proceedings) is to provide the expert conclusion based on the study of material and materialized objects submitted for forensic examination with application of specific veterinary expertise.

A forensic veterinarian who provided a conclusion at the request of the party in proceedings has the same rights and obligations as the forensic expert who conducted a forensic veterinary examination on the basis of court order (clause 6, Part 1, Article 106 of the Civil Procedure Code of Ukraine, clause 6 of Part 1 of Article 101 of the Code of Commercial Procedure of Ukraine, clause 7 of Part 1 of Article 104 of the Code of Administrative Proceedings of Ukraine).

The concept of forensic veterinary examination and its subject (forensic veterinarian) is a constituent component of forensic expert activity: a special type of activity related to organization and conduct

of forensic examinations and expert research aimed at providing concerned legal, physical or authorized persons or bodies with independent, qualified and objective conclusions, focused on maximum use of achievements of science and technology, creation and improvement of the scientific and methodological basis of forensic science, as well as on public administration in this area.

Article 7 of the specialized Law ⁵² notes that subjects of forensic expert activity are state specialized forensic science institutions, their territorial branches, communally owned forensic science institutions, and also forensic experts who are not employees of the specified institutions, and other specialists (experts) in respective areas of expertise in the manner and under conditions stipulated by legislation.

However, according to the results of the survey of respondents (judges, investigators and inquiry bodies) about forensic veterinarian, we obtained the following results (see Table 1).

Table 1

Results of statistical processing of respondents' survey questionnaires

Questions	Answers, %						
	judges		investigators		inquiry bodies		
	No.	%	No.	%	No.	%	
1. Have you ever conducted pre-trial investigation of crimes against animals?	Yes	—	—	65	70,7	40	80,0
	No	—	—	27	29,3	10	20,0
2. Have you had to order forensic veterinary examination while performing professional duties?	Yes	45	75,0	65	70,7	40	80,0
	No	15	25,0	27	29,3	10	20,0

⁵² Про судову експертизу URL: <https://zakon.rada.gov.ua/laws/show/4038-12#Text> (date accessed: 19.06.2022).

Questions	Answers, %						
	judges		investigators		inquiry bodies		
	No.	%	No.	%	No.	%	
3. Did you seek the advice of the forensic veterinarian when issuing a ruling on ordering forensic veterinary examination?	Yes	—	—	60	70,6	35	7,0
	No	—	—	25	29,4	15	30,0
4. Is it required to develop scientific and theoretical doctrine about forensic veterinarian and peculiarities of his legal status?	Yes	60	100	92	100	50	100
	No	—	—	—	—	—	—
5. Have you faced difficulties associated with involvement of a forensic veterinarian in procedure and order of forensic examination in your practice?	Yes	10	16,7	76	82,6	42	84,0
	No	50	83,3	16	17,4	8	16,0
6. Do you think there is a sufficient number of trained forensic veterinarians in Ukraine today? (Currently there are three of them)	Yes	60	100	92	100	50	100
	No	—	—	—	—	—	—
7. Are you aware of the full range of forensic researches that can be performed by a forensic veterinarian for forensic expert support of justice?	Yes	55	91,7	89	96,7	45	90,0
	No	5	8,3	3	3,3	5	10,0
8. Is it obligatory to order forensic veterinary examination to determine the cause of animal's death?	Yes	60	100	92	100	50	100
	No	—	—	—	—	—	—
9. Is it necessary to order forensic veterinary examination to establish the degree of severity of harm inflicted to animal's health?	Yes	60	100	92	100	50	100
	No	—	—	—	—	—	—

Questions	Answers, %						
	judges		investigators		inquiry bodies		
	No.	%	No.	%	No.	%	
10. Is it mandatory to order forensic veterinary examination to determine the extent of mutilation of an animal?	Yes	60	100	92	100	50	100
	No	—	—	—	—	—	—
11. Do you agree with the definition: “Forensic veterinarian is an independent subject of procedural legal relations and forensic expert activity who has a degree in veterinary medicine (specialist’s or master’s degree), has undergone professional expert training, who is certified and qualified as a forensic veterinarian in expert speciality 18.1 ‘Veterinary research’, on a professional basis possesses specific expertise and skills in the field of veterinary medicine, is empowered to solve tasks of forensic veterinary examination and involved in the procedure in the manner envisaged by law, studies objects submitted for forensic veterinary examination that contain information about circumstances of offense commission by applying specific expertise, provides the expert conclusion or notifies about the impossibility of its compilation”?	Yes	60	100	92	100	50	100
	No	—	—	—	—	—	—

Results of processing questionnaires show that respondents: carried out pre-trial investigation of crimes against animals; were subjects of ordering forensic veterinary examination while fulfilling professional duties; have received advisory assistance of a forensic veterinarian when concluding a ruling on ordering forensic veterinary examination; in practice encountered difficulties connected with involvement of a forensic veterinarian in procedure and order of forensic veterinary examination. What is more, respondents are aware of the range of

forensic researches that can be conducted by a forensic veterinarian for forensic expert support of justice. They believe that ordering forensic veterinary examination in order to determine the cause of death, the degree of severity of harm inflicted to the animal’s health, as well as its mutilation is justified and obligatory in the course of investigating offenses, and there is lack of trained forensic veterinarians in Ukraine.

Also, as stated by judges, investigators and inquiry bodies, the definition of the *forensic veterinarian* term is acceptable in the wording proposed by the author.

Challenges arising in the course of professional activities of respondents as to involvement of a forensic veterinarian in procedure and ordering forensic veterinary examination are associated with the lack of trained forensic veterinarians as well as with the lack of actual familiarization of law enforcement agencies with the range of forensic researches which forensic veterinarian may conduct in order to ensure forensic expert support for justice.

Therefore, a forensic veterinarian has procedural autonomy and independence and is an independent subject of forensic expert activity as he personally conducts forensic examination, draws up an expert conclusion based on his inner conviction, provides a conclusion on his own behalf and bears personal responsibility for its content.

*A forensic veterinarian possesses higher veterinary education of the level two (master's or specialist's) in compliance with Art. 5 of the Law of Ukraine On Higher Education⁵³ and specific expertise in the field of veterinary medicine, since questions addressed to him as well as his conclusion may not go beyond his specific expertise. Availability of higher veterinary education in a forensic expert is confirmed by a relevant diploma of higher education and diploma supplement. The diploma must specify that a person graduated from a corresponding higher education institution and gained a master's or specialist's degree in the speciality *Veterinary Medicine* and obtained professional qualification: doctor of veterinary medicine. A person who has a graduate degree lower than a master's*

or a specialist's degree cannot apply for qualification of a forensic veterinarian.

The criterion for correspondence of higher education to the expert speciality of a person intending to gain the qualification of a forensic veterinarian is the number of academic hours in relevant disciplines mentioned in the supplement of the diploma of higher veterinary education.

The forensic veterinarian has undergone a corresponding expert training. A mandatory requirement in the course of training of a forensic veterinarian is acquisition of knowledge on theoretical, organizational and procedural issues of forensic science, along with acquisition of practical skills in carrying out forensic examinations under the guidance of an experienced forensic veterinarian, also familiarization with methodological provisions of forensic veterinary examinations and practice of their application, which is regulated by the requirements of Section III of Regulations on the Central Expert Qualification Commission under the Ministry of Justice of Ukraine and Certification of Forensic Experts⁵⁴ (hereinafter referred to as Regulations on the CEQC). Training of forensic veterinarians in state forensic science institutions in the expert speciality 18.1 *Veterinary research* approved by the Head of the Central Expert Qualification Commission (hereinafter referred to as the CEQC) is carried out according to three separate programs, in the development of which we were directly involved: training program No. 1 is intended for a specialist who first expressed a desire to become a forensic veterinarian; program No. 2: for forensic veterinarians who intend

53 Про вищу освіту : Закон України від 01.07.2014 р. № 1556-VII (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/1556-18#Text> (date accessed: 19.08.2022).

54 Про затвердження Положення про Центральну експертно-кваліфікаційну комісію при Міністерстві юстиції України та атестацію судових експертів : наказ Мін'юсту України від 03.03.2015 р. № 301/5 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z0249-15#Text> (date accessed: 01.06.2022).

to confirm their qualifications for the first time; program No. 3 is for forensic veterinarians aimed at confirming their qualifications⁵⁵.

Training of forensic veterinarians involves their learning of both substantive and procedural legislation of Ukraine on ordering and conducting forensic examinations, as well as of individual sections of the specific part of forensic veterinary medicine (for example, forensic veterinary thanatology, forensic veterinary traumatology, forensic veterinary toxicology and etc.). Moreover, doctors of veterinary medicine who intend to obtain the qualification of forensic veterinarian must master the rules and methods of forensic veterinary examination developed by specialists of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute» while carrying out research (in particular, *Rules for forensic veterinary determination of the degree of severity of harm inflicted to the animals' health*⁵⁶, *Methodology of forensic veterinary examination of animals for establishing the extent of their mutilation*⁵⁷; *Methodology of forensic veterinary examination of animal carcasses*⁵⁸; *The*

*procedure of removing objects of forensic veterinary examination from animal carcass for laboratory research*⁵⁹; *Rules for forensic veterinary examination of animal carcasses*⁶⁰, etc.).

He is certified, attained qualification of a forensic veterinarian in the expert speciality 18.1 "Veterinary research" and is awarded with a certificate qualifying him to work as a forensic expert. In conformity with the requirements of Sections IV and V of Regulations on the CEQC, only certified veterinarians are allowed to independently conduct forensic veterinary examinations in state specialized forensic science institutions.

Evaluation of employees (in accordance with Article 1 of the Law of Ukraine *On Professional Development of Employees*⁶¹) is assessment of correspondence of their professionalism to qualification requirements and job duties. As noted by H. V. Osovskaya and co-authors⁶², evaluation is the main method of personnel performance appraisal.

Evaluation of a person who intends to gain qualification of a forensic expert in the expert speciality 18.1 *Veterinary research* is carried out to ensure his high

55 Програма підготовки судових експертів № 1. Експертна спеціальність 18.1 – ветеринарні дослідження. URL: <https://minjust.gov.ua/files/general/2021/04/18/20210418204623-34.pdf> (date accessed: 01.08.2022) ; Програма підготовки судових експертів № 2. Експертна спеціальність 18.1 – «Ветеринарні дослідження». URL: <https://minjust.gov.ua/files/general/2021/04/18/20210418204654-21.pdf> (date accessed: 01.08.2022) ; Програма підготовки судових експертів № 3. Експертна спеціальність 18.1 – ветеринарні дослідження. URL: <https://minjust.gov.ua/files/general/2021/04/18/20210418204729-73.pdf> (date accessed: 01.08.2022).

56 Яценко І. В., Парилівський О. І. Правила судово-ветеринарного визначення ступеня тяжкості шкоди, заподіяної здоров'ю тварини : метод. рек. Харків, 2022. 47 с.

57 Яценко І. В., Парилівський О. І., Казанцев Р. Г. Методика судово-ветеринарного дослідження тварин з метою встановлення їх каліцтва. Харків, 2021. 50 с.

58 Їх же. Методика судово-ветеринарної експертизи трупів тварин. Харків, 2022. 336 с.

59 Їх же. Порядок вилучення об'єктів судово-ветеринарної експертизи з трупа тварини для лабораторних досліджень : метод. рек. Харків, 2021. 51 с.

60 Їх же. Правила судово-ветеринарної експертизи трупів тварин : метод. рек. Харків, 2022. 41 с.

61 Про професійний розвиток працівників : Закон України від 12.01.2012 р. № 4312-VI (зі змін та допов.). URL: <https://zakon.rada.gov.ua/laws/show/4312-17#Text> (date accessed: 01.09.2022).

62 Осовська Г. В., Семенюк Т. В., Осовський О. А. Атестація як основний метод оцінюван-

professional level enabling to conduct research on the basis of modern scientific and methodological achievements of forensic science by passing a qualification exam to test knowledge of theoretical, organizational and procedural issues required for independent conduct of forensic veterinary examination. The expert speciality 18.1 *Veterinary research* is a separate area of specific expertise determining competence of a forensic expert in carrying out forensic veterinary examination, on which basis qualification of a forensic expert is awarded.

Articles 16 and 17 of the specialized Law set out the procedure for determining level of professional training of forensic experts and evaluating them for the right to independently conduct forensic examination (in particular, forensic veterinary examination). At the same time, the purpose of forensic expert evaluation is to assess professional level of specialists who are involved in forensic examinations or who participate in the development of theoretical and methodological basis of forensic examination (Article 16).

In order to be allowed to independently conduct forensic veterinary examination, a person must attain qualification of a forensic veterinarian in the expert speciality 18.1 *Veterinary research*, i.e. possess sufficient expertise and skills determined by evaluation.

Qualification of a forensic veterinarian is a set of competences, knowledge and skills in the expert speciality 18.1 *Veterinary research* required to conduct forensic veterinary examination, which is confirmed by a certificate of awarding

qualification of a forensic expert. An expert speciality is a separate area of specific expertise determining the competence of a forensic expert in conducting a particular type of forensic examination, under which qualification of a forensic expert is awarded (clause 4 of Article 1 of Draft Law No. 6284-2). Qualification of a forensic veterinarian is awarded and confirmed according to evaluation results under the Decision of the Specialized Expert Qualification Commission (hereinafter referred to as the SEQC) of the Ministry of Justice of Ukraine (Article 16).

As stated in Article 16 of the specialized Law (depending on specialization and training level) employees of the state specialized institution are awarded qualification of a forensic (in particular, forensic veterinarian) expert and qualification class.

In accordance with the Procedure for Awarding Qualification Classes of Forensic Experts to Employees of Forensic Science Institutions of the Ministry of Justice of Ukraine⁶³ they are awarded by the Order of the Institution Director based on the Decision of the SEQC (clause 8): depending on position, seniority and experience, academic degree and level of professional expertise in the availability of forensic expert qualification (clause 2).

After evaluation of a forensic veterinarian and his acquisition of qualifications in the expert speciality 18.1 *Veterinary research*, the Ministry of Justice of Ukraine issues him a certificate on awarding qualification of a forensic expert, which indicates: certificate number; full name of a forensic veterinarian; the date

ня персоналу. *Ефективна економіка*. 2017. № 11. URL: <http://www.economy.nayka.com.ua/?op=1&z=5873> (date accessed: 01.09.2022).

63 Про затвердження Порядку присвоєння кваліфікаційних класів судових експертів працівникам науково-дослідних установ судових експертиз Міністерства юстиції України : наказ Мін'юсту України від 30.12.2011 р. № 3660/5 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z0002-12#Text> (date accessed: 01.09.2022).

of adopting the Decision by the CEQC on the right to conduct forensic veterinary examinations in the speciality 18.1 *Veterinary research*; signature of a Head and secretary of the CEQC and the date until which this certificate is valid.

In case of certificate expiration, the forensic expert loses the right to carry out forensic veterinary examination and expert research until he confirms his qualification. A forensic veterinarian has to confirm the level of his professionalism by undergoing re-evaluation every 3 years.

He on a professional basis possesses veterinary expertise, skills and professional skills in the field of veterinary medicine, is competent to solve forensic expert tasks. We propose to understand specific veterinary expertise as knowledge of veterinary medicine, which application is expedient or obligatory for establishing circumstances of a veterinary nature in the process of proof in any type of court proceedings, which are possessed by experts with veterinary education and qualification in the area of expertise 21 "Veterinary Medicine", speciality 211 "Veterinary medicine", who have professional skills and relevant work experience.

A specialist acquires specific veterinary expertise while studying at higher education institution as well as while undergoing practice in the expert speciality 18.1 *Veterinary research*. Professional can be considered skills which pool a certain expertise; actual abilities and competencies that the forensic veterinarian did not just apply once, but learned, consolidated and is able to implement in professional activities. Competences of a forensic veterinarian entail procedural and scientific components, the first competence is the scope of powers granted to a forensic veterinarian by procedural law, the second is the scope of specific veterinary expertise and skills that a forensic expert

must possess in order to conduct forensic veterinary examinations.

Competence of a forensic veterinarian is a subjective characteristic reflecting the degree of: his mastery of the theory, methods and methodologies of expert research within the scope of forensic veterinary examination; ability to use expert technologies and regulatory framework in this area; direct participation in forensic veterinary examinations; the ability to independently solve set expert tasks and develop expert methods and methodological guidelines, conduct research and write research papers by his area of expertise, take part in scientific and practical conferences and review conclusions of other forensic veterinarians, etc.

Competence of a forensic veterinarian is defined by his own expertise, level of special training, awareness and knowledge about current methods of expert research, as well as by individual traits, etc.

Competence of a forensic veterinarian is ensured through existence of state specialized forensic science institutions where scientific and methodical guidance of forensic expert activities is carried out, and there is a system that ensures training and certification of forensic veterinarians. Every third year a forensic veterinarian confirms his competence by passing qualification exam (clause 4, Section V of Regulations on the CEQC).

In the light of the above, questions addressed to the forensic expert and his conclusion should not go beyond specific veterinary expertise and competence of a forensic expert. As an example, establishment of the fact that the animal's death was caused by massive bleeding which started due to damaging internal organs with a sharp instrument falls within the competence of a forensic veterinarian, whereas determination of the type of

weapon with the help of which an animal was injured falls within the competence of a forensic ballistics expert.

Forensic veterinary examination is entrusted to the forensic expert or he is involved in its conduct in the manner envisaged by law, in particular in accordance with the procedural legislation, the specialized Law, as well as with departmental instructions⁶⁴: upon the decision of the investigator or prosecutor (for criminal offenses) or the inquiry body (for offenses defined by legislation as criminal offenses). What is more, a forensic expert may be involved in conduct of forensic veterinary examination by the defense counsel, investigating judge or the court (upon court's ruling).

A forensic veterinarian is not allowed *“to carry out forensic examination without the written instruction of a Head (Deputy Head) of forensic science institution, a Head of structural subdivision”*⁶⁵ in specialized forensic expert institutions (paragraphs 1–2 of clause 2.3 of the Instructions on the Order and Conduct of Forensic Examinations and Expert Research; hereinafter referred to as the Instructions on the Order).

A certified forensic veterinarian who does not work in state specialized forensic science institution is not allowed *“to*

carry out forensic examination if it was not personally entrusted to him” (subclause 6 of clause 4 of Section II of the Instructions on the Peculiarities of Implementing Forensic Activities by Certified Forensic Experts Who Do Not Work at State Specialized Forensic Science Institutions⁶⁶, hereinafter referred to as *the Instructions on the Peculiarities of Implementing*).

The Criminal Procedure Code of Ukraine defines grounds for conducting forensic examination (Article 242), the procedure for involving a forensic expert by the prosecution, the defense, the investigating judge upon the motion of the defense (Article 243), consideration by the investigating judge of the motion for forensic examination (Article 244), carrying out forensic examination upon the court order (Article 332)⁶⁷.

The Civil Procedure Code of Ukraine regulates order of forensic examination by the court (Articles 103, 104), conduct of forensic examination at the request of parties to proceedings (Article 106), conduct of forensic examination (Article 108)⁶⁸.

The Code of Commercial Procedure of Ukraine contains the following rules concerning forensic expert's activities:

64 Про затвердження Інструкції про призначення та проведення судових експертиз та експертних досліджень та Науково-методичних рекомендацій з питань підготовки та призначення судових експертиз та експертних досліджень : наказ Мін'юсту України від 08.10.1998 р. № 53/5 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z0705-98#Text> (date accessed: 01.09.2022) ; Про затвердження Інструкції про особливості здійснення судово-експертної діяльності атестованими судовими експертами, що не працюють у державних спеціалізованих експертних установах : наказ Мін'юсту України від 12.12.2011 р. № 3505/5 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z1431-11#Text> (date accessed: 01.09.2022).

65 Про затвердження Інструкції про призначення URL: <https://zakon.rada.gov.ua/laws/show/z0705-98#Text> (date accessed: 01.09.2022).

66 Про затвердження Інструкції про особливості здійснення URL: <https://zakon.rada.gov.ua/laws/show/z1431-11#Text> (date accessed: 01.09.2022).

67 Кримінальний процесуальний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/4651-17#Text> (date accessed: 01.06.2022).

68 Цивільний процесуальний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/1618-15#Text> (date accessed: 01.06.2020).

order of forensic examinations by the court (Articles 99, 100), conduct of forensic examination at the request of parties to proceedings (Article 101), conduct of forensic examination (Article 103) 69.

The Code of Administrative Proceedings of Ukraine governs: order of forensic examination by the court (Articles 102, 103), conduct of forensic examination at the request of participants to proceedings (Article 104), conduct of forensic examination (Article 106) 70.

The grounds for carrying out forensic (in particular, forensic veterinary) examination are defined in the specialized Law, as well as in by-laws of Ukraine (in particular, in paragraph 1, clause 1.8, Section I of the Instructions on the Order: *“The basis for conducting forensic examination <...> is a procedural document on ordering forensic examination drawn up by an authorized person (body), or a contract with a forensic expert or forensic science institution concluded at the written request of a person in cases envisaged by law”*⁷¹).

The forensic veterinarian is authorized to solve tasks related to objects of forensic veterinary examination containing information about circumstances of offense commission, to conduct research on them and provide the expert conclusion or notify on the impossibility of its compilation. The forensic veterinarian does not lead investigation and does not solve the whole investigated case, but only examines material and materialized objects within the limits of his specific veterinary expertise and the expert speciality 18.1 *Veterinary research* and provides the expert conclusion on the basis of research results. In this respect,

the forensic veterinarian is obliged to obtain procedural document on the order of forensic veterinary examination and to conduct forensic examination entrusted to him (paragraph 3 of clause 2.2 of the Instructions on the Order and subclause 2 of clause 3 of Section II of the Instructions on the Peculiarities of Implementing); to adhere to terms of conducting forensic examination (clause 1.13 of the Instructions on the Order); to independently carry out comprehensive investigation into material and materialized objects (clause 1 of Part 5 of Article 69 of the Criminal Procedure Code of Ukraine; clause 1 of Part 1 of Article 12 of the specialized Law; paragraph 4 of clause 2.2 of the Instructions on the Order and subclause 3 of clause 3 of Section II of the Instructions on the Peculiarities of Implementing); to provide a justified and objective written conclusion of the forensic expert on addressed issues, and if necessary, to clarify it (clause 1 of Part 5 of Article 69 of the Criminal Procedure Code of Ukraine; Parts 3 and 4 of Article 72 of the Civil Procedure Code of Ukraine; Part 3 of Article 69 of the Code of Commercial Procedure of Ukraine, Part 3 of Article 68 of the Code of Administrative Proceedings of Ukraine, clauses 1–2 of Part 1 of Article 12 of the specialized Law; paragraph 4 of clause 2.2 of Section II of the Instructions on the Order and subclause 3 of clause 3 of Section II of the Instructions on the Peculiarities of Implementing). Under certain circumstances that make it impossible to provide the expert conclusion, the latter must make a notification about the impossibility of its compilation (clause 4.19 of Section IV the Instructions on the Order).

69 Господарський процесуальний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/1798-12#Text> (date accessed: 01.06.2022).

70 Кодекс адміністративного судочинства України URL: <https://zakon.rada.gov.ua/laws/show/2747-15#Text> (date accessed: 01.06.2022).

71 Про затвердження Інструкції про призначення URL: <https://zakon.rada.gov.ua/laws/show/z0705-98#Text> (date accessed: 01.09.2022).

Therefore, a forensic veterinarian in the course of fulfilling professional duties carries out his forensic expert activities in strict conformity with the present legislation, as violation of the specified rules and regulations entails legal (criminal, civil, administrative, financial and disciplinary) responsibility for a forensic veterinarian.

The forensic veterinarian belongs to participants in proceedings and fulfils auxiliary functions in it. The trail participants in any type of court proceedings (excluding the participants in case and their representatives) are assistant judge, secretary of the court hearing, court administrator, witness, expert, legal expert, interpreter, specialist (see, e.g., Article 65 the Civil Procedure Code of Ukraine).

The forensic veterinarian has no personal interest in proceedings. This means that the forensic veterinarian performs purely professional functions: provision of the judiciary with evidence-based, objective, credible and truthful conclusions related to objects submitted for his research, as well as resolution of questions addressed to him in the document on ordering forensic veterinary examination or involvement of a forensic expert. Personal disinterest of the forensic expert while forensic veterinary examination and also veracity of results obtained by him are ensured by the expert's oath (Part 1 of Article 356 of the Criminal Procedure Code of Ukraine), his legally regulated procedural status, which includes duties, rights, prohibitions, and the possibility for recusal and liability in case of violation of legislation requirements.

The forensic veterinarian has no material and legal interest in procedure outcome. A direct personal interest of a forensic veterinarian is when an expert gains financial or other benefit as a result of conducting forensic examination in a specific case, at the same time an indirect

personal interest of a forensic expert is the one when not the expert but other persons related to him (for example, relatives or close ones) are interested in case outcome. Thus, Ukrainian legislation stipulates the requirement to specify in the expert conclusion the fact that the forensic expert has been warned (aware) of responsibility for a deliberately false conclusion (Part 1 of Article 356 of the Criminal Procedure Code of Ukraine), and in case of ordering forensic (in particular, a forensic veterinary) examination by the court: also of responsibility for refusing without valid reasons to fulfil duties assigned to him (Part 7 of Article 102 of the Civil Procedure Code of Ukraine; Part 7 of Article 98 of the Code of Commercial Procedure of Ukraine; Part 7 of Article 101 of the Code of Administrative Proceedings of Ukraine; paragraph 1, clause 2.4, Section II of the Instructions on the Order). In turn, both Instructions define prohibitions concerning contacts with persons not stipulated by legal regulations if such persons are directly or indirectly interested in forensic examination results (paragraph 6, clause 2.3, of Section II of the Instructions on the Order and subclause 4 of clause 4 of Section II of the Instructions on the Peculiarities of Implementing). In this regard, the procedural legislation, the specialized Law and the Instructions require to apply recusal in the availability of circumstances stipulated by the legislation, that make it impossible for a forensic expert to perform forensic examination (clause 5, Part 5, Article 69 of the Criminal Procedure Code of Ukraine; clause 3, Part 1, Article 12 of the specialized Law; paragraph 2 of clause 2.2 of Section II of the Instructions on the Order and subclause 1 of clause 3 of Section II of the Instructions on the Peculiarities of Implementing).

Forensic veterinary examination, which is conducted in state specialized forensic science institution, is performed at

the expense of the State Budget. Its conduct is the main duty of a forensic expert, what he is getting salary for. At the same time (in accordance with paragraph 11, clause 2.1 of Section II of the Instructions on the Order), a forensic expert may “receive fee for conducting forensic examination and in compliance with legislation compensation (reimbursement) of expenses for the work done and expenses related to summons for providing clarifications and testimony, in the event that this is not his official duty”⁷² (e.g., if he is a certified forensic expert who does not work in state specialized forensic science institution).

To summarize, fulfilling all the legislative requirements concerning prohibition of contact with persons who are directly or indirectly interested in forensic examination results will ensure that the forensic veterinarian provides an evidence-based, objective, reliable and veracious conclusion.

Information about the forensic veterinarian is entered into the State Register of Certified Forensic Experts. As stated in Art. 9 of the specialized Law, information about the forensic veterinarian is entered into the State Register of Certified Forensic Experts: official electronic database of persons who in conformity with the procedure envisaged in the Law of Ukraine *On Judicial Examination* have acquired the qualification of a forensic expert⁷³. The holder of the Register is the Ministry of Justice of Ukraine maintaining it.

Information about certified forensic experts contained in the Register is posted on the website of the Ministry of Justice of Ukraine. Inclusion in it is not an obligatory requirement for carrying out forensic

expert activities. Currently, this Register includes information on 3 forensic veterinarians who undergo systematic training at National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute». The Register contains information about certified forensic (in particular, forensic veterinarians) experts and forensic experts who are not employees of state specialized institutions (they are entered into the Register based on the statement of a forensic expert). In accordance with clause 9 of the Procedure for Maintaining the State Register of Certified Forensic Experts, the following information about the forensic expert's identity shall be entered into it:

- full name (if available);
- the name of expert qualification commission, the date and number of its decision and its brief summary (awarding/confirmation/advancement of the forensic expert's qualification, prolongation of the certificate validity, bringing the forensic expert to disciplinary responsibility), information on temporary termination or renewal of forensic expert activity;
- the number and validity period of the certificate or document confirming qualification of a forensic expert (if the issuance of the certificate is not stipulated, a corresponding entry is made), information on the reissuance of the certificate on awarding qualification of a forensic expert, on invalidity and/or withdrawal of the certificate;
- type of examination (for example, forensic veterinary), index and type

72 Про затвердження Інструкції про призначення ... URL: <https://zakon.rada.gov.ua/laws/show/z0705-98#Text> (date accessed: 01.09.2022).

73 Про затвердження Порядку ведення державного Реєстру атестованих судових експертів : наказ Мініюсту України від 29.03.2012 р. № 492/5 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z0484-12#Text> (date accessed: 01.06.2022).

of expert speciality (for example, 18.1 *Veterinary research*);

- institutional affiliation, location, official e-mail address and phone number of the forensic expert;
- the date and number of the order on dismissal of the forensic expert of state specialized institution⁷⁴.

The administrator of the Register, upon the motion of the head of the CEQC, amends it in case of bringing to disciplinary responsibility of a forensic expert who is not an employee of state specialized expert institution, or in case of withdrawal of the certificate on awarding qualification of a forensic expert.

Though legislation envisages the entry of information about a forensic veterinarian into the State Register of Certified Forensic Experts, this procedure is not mandatory and cannot fundamentally affect his fulfilment of forensic expert duties.

In order to find out opinion of the ordering party of the forensic veterinary examination as to whether they consulted certified forensic experts during order of this forensic examination, we conducted a questionnaire which proved that for the appointment of forensic veterinary examination, respondents most frequently turned to the State Registry for the purpose of choosing state forensic science institution: this view was expressed by 100% of 60 judges, 92.4% of 85 inquiry bodies, 90% of 45 investigators, 66.7% of 20 animal rights activists and 96% of 48 advocates.

Conclusions

To conclude, by applying a variety of research methods, it is possible to word an extended definition for the concept of *forensic veterinarian as an independent subject of procedural legal relations and*

forensic expert activity, who possesses higher veterinary education (specialist's or master's degree level), has undergone professional expert training, is certified and qualified as a forensic veterinarian in the expert speciality 18.1 "Veterinary research", on a professional basis possesses specific expertise and skills in the field of veterinary medicine, is empowered to solve tasks of forensic veterinary examination and involved in accordance with legislation to carry out research on objects of forensic veterinary examination containing information about circumstances of offense commission by applying specific expertise, provides the expert conclusion or notifies about the impossibility of its compilation.

This wording is based on special criteria for determining procedural status of a forensic veterinarian, specifying peculiarities of his professional activities in the system of forensic expert support of justice.

In return, the procedural criteria for determining status of a forensic veterinarian testify to his position in proceedings during forensic expert support of justice: he belongs to participants in proceedings and fulfils auxiliary functions in it; has no personal interest in procedure; has no material and legal interest in procedure outcome; information about the forensic veterinarian is entered into the State Register of Certified Forensic Experts (although this criterion is not mandatory).

Individual criteria for determining procedural status of a forensic veterinarian in Ukrainian procedural legislation, the specialized Law, the Regulations on CEQC, as well as in the instructions, are his tools for exercising procedural powers while professional activities.

The common for Ukrainian procedural legislation term *expert* should be replaced

⁷⁴ Про затвердження Порядку ведення URL: <https://zakon.rada.gov.ua/laws/show/z0484-12#Text> (date accessed: 01.06.2022).

with the *forensic expert* term (in the meaning provided in the specialized Law and Draft Laws on Forensic Expert Activity), since the first term may refer to any area of human activity, and the second: specifies the subject area of such specialist's activity (forensic expert support of justice).

Our further research involves the study of the legal status of a forensic veterinarian as subject of forensic expert activity in the context of Ukrainian legislation (in particular, his rights, duties, prohibitions, restrictions and responsibilities).

Судово-ветеринарний експерт як суб'єкт процесуальних правовідносин і судово-експертної діяльності

Іван Яценко

Запропоновано розширену дефініцію «судово-ветеринарний експерт», яка полягає в тому, що це самостійний суб'єкт процесуальних правовідносин і судово-експертної діяльності, який має вищу ветеринарну освіту (освітній рівень спеціаліста або магістра), пройшов фахову експертну підготовку, атестований і набув кваліфікації судово-ветеринарного експерта за експертною спеціальністю 18.1 «Ветеринарні дослідження», має спеціальні знання й навички у сфері ветеринарної медицини на професійній основі, уповноважений на вирішення завдань судово-ветеринарної експертизи та залучений в обумовленому законодавством порядку здійснювати дослідження об'єктів судово-ветеринарної експертизи, що містять відомості про обставини вчинення правопорушення, шляхом використання спеціальних знань, надає висновки судового експерта або повідомляє про неможливість його надання. Аргументовано, що спеціальні критерії визначення процесуального статусу судово-ветеринарного експерта деталізують специфіку його професійної діяльності в системі судово-експертного забезпечення правосуддя, зумовлену його спеціальними ветеринар-

ними знаннями. Процесуальні критерії статусу судово-ветеринарного експерта свідчать про його роль у провадженні, зокрема: належить до інших (замінних) учасників провадження й виконує у ньому допоміжні функції; не представляє у процесі власних інтересів; не має матеріально-правової зацікавленості в результатах процесу; дані про судово-ветеринарного експерта внесені до Держреєстру атестованих судових експертів (хоча цей критерій не обов'язковий).

Ключові слова: судово-ветеринарна експертиза; судово-ветеринарний експерт; судовий експерт; судово-експертна діяльність; критерії визначення правового статусу судово-ветеринарного експерта; спеціальні ветеринарні знання.

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Declaration of Competing Interest

Author declare no conflict of interest.

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Relevance of Forensic Linguistic Speech Analysis in Criminal Cases Regarding Threat Incrimination

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This article is devoted to specific issues of the linguistic semantic and textual speech analysis in criminal cases regarding incrimination of threats. Currently, forensic expert classifies the means of threats identified in the speech message (text) submitted for research at a pragmatic level. In contrast to purely semantic analysis of statements (when information is affirmative), pragmatic approach makes it possible to investigate the speech act as an expression of the will of a person, his emotions and feelings, determine the message illocutionary content, establish the addressee's reaction to the information expressed by the addressee, etc. The article purpose is to determine the role of linguistic speech analysis in criminal cases regarding the threat incrimination. The objects of such forensic examination include the texts of text messages, e-mails, postcards, conversations (in particular, phone), audio and video messages, public speeches, etc. Illocutions of threats in statements where lexemes are used in direct meanings, and the sentences have a complete form according to the syntactic structure, are established on the basis of general semantic and textual research. Analyzing communicative

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situations in which incomplete or indirect statements are used, that means phrases expressed in an indirect form, where the illocution of a threat can be determined through speech intentions, communicative intentions, subjective-modal verbalizers, etc., is necessary. Forensic expert conclusions based on the results of linguistic speech analysis of is one of the powerful means of making a court decision and an important argument during the pre-trial investigation in criminal cases regarding threat incrimination.

Keywords: discourse; communicative situation; lexical and grammatical analysis; linguistic speech analysis; act speech of threats; pragmatic analysis.

Research Problem Formulation

At the present stage of legal Ukrainian State development, the issues of application of linguistic knowledge in the legal field are becoming urgent. In particular, in criminal cases regarding expression of threats to murder, harm to health, destruction or damage to property, forensic expert conclusion based on the results of linguistic semantic and textual analysis will allow to confirm or refute such speech action during the pre-trial investigation and trial. Thus, one of the urgent tasks of linguistic speech analysis is to determine availability/lack of statements expressed in the form of threats in the speech object provided for research.

Analysis of Essential Researches and Publications

Research relevance of the speech act of threat is due to complexity of its conceptual content and the variety of

lexical and grammatical expression. In modern linguistics, there are different approaches to the study of such an act and several directions of linguistic analysis of threats. N. Voitsekhivska considers communicative acts of threats as complex speech acts, «*the purpose of which is to satisfy the communicative purpose of the aggressor speaker through intimidation of the addressee*»¹. The researcher emphasizes that threat tactics in the text can be expressed both directly and indirectly, and the main thing in its definition is the context, which thorough semantic research makes it possible to identify this act and interpret it.

For threat realization, as K. Korotych notes, they use the same tactics, motivated by «*the addressee need to unambiguously declare his communicative goal by threatening to change addressee intentions to perform some actions*»².

L. Azhniuk, in his pragmalinguistic parameters, calls the speech act of threat as one of the imperative speech

- 1 Войцехівська Н. Засоби вираження погрози в українському конфліктному діалогічному дискурсі. *Гуманітарна освіта в технічних вищих навчальних закладах*. 2014. № 30. С. 27. URL: http://nbuv.gov.ua/UJRN/gotvnz_2014_30_4 (date accessed: 07.09.2022).
- 2 Коротич К. Комунікативні стратегії погрози та подолання страху в дискурсі української преси ХХ–ХХІ століть: мовні механізми впливу на реципієнта. *Вісник Львівського університету. Серія філологічна*. 2009. 2009. Вип. 46. Ч. 1. С. 141.

genres, involving implementation of three mandatory content elements: (1) *incitement to commit or not commit a certain action by the addressee of the message*; (2) *actual threats*; (3) *a causal content relationship between these elements* ³. The content elements indicated by researcher can be both expressed at the level of the surface content structure of the text, and «*implicit in the deep content layers*» ⁴.

At the same time, K. Brynov's position believing that in cases involving a threat, an forensic linguist can solve only one task related to the qualification of the speech behavior of author communication as being or not a speech act of threat, deserves attention⁵. Differences in approaches to the study of the communicative act «threat» are due to a significant number of forms of its speech expression, that is, in each individual context, the threat can be considered as a strategy, as a kind of tactic or even a certain speech technique of influencing the addressee.

Abroad, the issues of Forensic linguistics (in particular, analysis of threats) were considered by such scientists as: J. J. Magyar ⁶, I. Moulinou ⁷, J. Rioux-

Turcotte and V. Denault ⁸, J. Longhi ⁹, T. Babena ¹⁰ et al.

Therefore, in the context of modern linguistic semantic and textual research on speech, it is relevant to analyze the communicative act of threats at the pragmatic level. Unlike purely semantic analysis of statements, when the information is affirmative in nature, a pragmatic approach makes it possible to explore a certain speech act as an expression of the will of the person, his emotions and feelings, to determine the illocutionary content of the message and the addressee reaction to information expressed by the addressee, etc.

Article Purpose

Role clarification of linguistic speech analysis in criminal cases regarding threat incrimination. Achieving this goal involves solving the following tasks: determining the subject of linguistic research, concretizing objects of linguistic speech analysis to establish the speech act of threat, outlining the range of tasks of

3 Ажнюк Л. В. Лінгвістична експертиза як юридичний інструмент. *Магістеріум. Мовознавчі студії*. 2017. Вип. 66. С. 11. URL: http://nbuv.gov.ua/UJRN/Magisterium_mov_2017_66_4 (date accessed: 07.09.2022).

4 Ibidem.

5 Бринев К. И. Теоретическая лингвистика и судебная лингвистическая экспертиза : монография / под ред. Н. Д. Голева. Барнаул, 2009. С. 144.

6 Magyar J. J. Hansard as an Aid to Statutory Interpretation in Canadian Courts from 1999 to 2010 (August 30, 2011). DOI: [10.2139/ssrn.2233370](https://doi.org/10.2139/ssrn.2233370) (date accessed: 07.09.2022).

7 Moulinou I. Explicit and implicit discursive strategies and moral order in a trial process. *Journal of Language Aggression and Conflict*. 2019. Vol. 7. Is. 1. Pp. 105–132. DOI: [10.1075/jlac.00021.mou](https://doi.org/10.1075/jlac.00021.mou) (date accessed: 07.09.2022).

8 Rioux-Turcotte J., Denault V. L'expertise en linguistique devant les tribunaux québécois et fédéraux canadiens, portrait global et conséquences pour les professionnels du système judiciaire. *Int J Semiot Law*. 2019. Vl. 32. Pp. 427–447. DOI: [10.1007/s11196-018-9585-6](https://doi.org/10.1007/s11196-018-9585-6) (date accessed: 07.09.2022).

9 Longhi J. Using digital humanities and linguistics to help with terrorism investigations. *Forensic Sci Int*. 2021 Jan; 318:110564. DOI: [10.1016/j.forsciint.2020.110564](https://doi.org/10.1016/j.forsciint.2020.110564) (date accessed: 07.09.2022).

10 Babena T. Réflexions sur le discours haineux: la loi face à la praxis langagière. *Jeynitaare: Revue panafricaine de linguistique pour le développement*. 2021. Vl. 1 (1). DOI: [10.46711/jeynitaare.2021.1.1.4](https://doi.org/10.46711/jeynitaare.2021.1.1.4) (date accessed: 07.09.2022).

semantic and textual research (taking into account legal norm disposition).

Main Content Presentation

In modern legislation of Ukraine, specific threats are considered a crime — in particular, under Part 1 of Art. 129 of the Criminal Code of Ukraine ¹¹:

*“Death threat, if there was a real reason to fear that the threat would be carried out shall be punishable by arrest for a term of up to six months or restriction of liberty for a term of up to two years”*¹².

In the comments to Art. 129 of the Criminal Code of Ukraine it is stated that not only concrete and real actions can be considered as a death threat. The reality of the threat is determined by the sufficiency of the grounds for fearing its implementation, which in each case are different. In order to find out reality, threats are important the form, nature, place, time, circumstances of its expression, nature of the previous relationship between the perpetrator and the victim, etc. Of particular importance in such cases is the perception of threats by the victims themselves, as well as by others present.

Article 195 of the Criminal Code stipulates:

“The threat of destruction of another’s property by arson, explosion or other generally dangerous means, if there were real grounds to fear the threat

shall be punishable by a fine of up to fifty tax-free minimum incomes of citizens or community service for a term of sixty to one hundred twenty hours, or correctional labor

*for a term of up to one year, or arrest for a term of up to six months”*¹³.

According to the scientific and practical commentary to the Criminal Code of Ukraine ¹⁴ (hereinafter referred to as Scientific and practical commentary on Criminal Code of Ukraine), the threat of destruction of property consists in intimidation to immediately or in the future destroy certain property that is alien to the accused. The threat of destruction of someone else’s property forms part of the crime only when the perpetrator threatens to do so by arson, explosion or in a generally dangerous way.

Part 1 of Article 346 of the Criminal Code of Ukraine states:

“Threat to murder, harm to health, destruction or damage to property, as well as kidnapping or imprisonment of the President of Ukraine, the Chairman of the Verkhovna Rada of Ukraine, the People’s Deputy of Ukraine, the Prime Minister of Ukraine, a member of the Cabinet of Ministers of Ukraine, the Chairman or a member of the High Council of Justice, the Chairman or a member of the High Qualification Commission of Judges of Ukraine, the Chairman or a judge of the Constitutional Court of Ukraine or the Supreme Court or higher specialized courts, the Prosecutor General, the Director of the National Anti-Corruption Bureau of Ukraine, the Director of the Bureau of Economic Security of Ukraine, the Director of the State Bureau of Investigation, the Commissioner for Human Rights of the Verkhovna Rada of Ukraine, the Chairman or another member of the Accounting Chamber, the Chairman of the National Bank of Ukraine, the Head of the

11 Кримінальний кодекс України від 05.04.2001 р. № 2341-III (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/2341-14#Text> (date accessed: 07.09.2022).

12 Ibidem.

13 Ibidem.

14 Кримінальний кодекс України. Науково-практичний коментар : у 2 т. ; за заг. ред. В. Я. Тація, В. П. Пшонки, В. І. Борисова, В. І. Тютюгіна. 5-те вид., допов. Т. 2. : Особлива частина / Ю. В. Баулін, В. І. Борисов, В. І. Тютюгін та ін. Харків, 2013. 1040 с.

Political Party of Ukraine, as well as shall be punishable by restraint of liberty for a term up to five years or imprisonment for the same term”¹⁵.

According to the Scientific and practical commentary on Criminal Code of Ukraine, the threat of harm to health occurs when the victim is threatened with beatings, causing bodily harm of any severity (in particular, through the use of narcotic drugs, psychotropic, poisonous, potent substances, electric current, etc.).

Thereby, while linguistic semantic and textual analysis within the framework of a specific criminal proceeding or expert linguistic research in order to establish the data that may be the object of criminal proceedings or court proceedings for the above crimes, it is important not only to prove the relevance of a particular statement or text to the speech act of the threat, but also to find out the objective content of this threat (its semantic content). In this way, the expert linguist determines whether this is a threat to kill, cause bodily harm (violence) or damage to property, finding (if possible) a specific addressee (s), etc.

Objects of linguistic semantic and textual speech analysis regarding detection of expressions expressed in the form of threats are products of speech activity (from a single word to an entire text), recorded in written and oral forms. The subject of this examination is factual data containing statements (speech constructions), expressed in the form of a promise to cause certain troubles (in order to induce the addressee to perform/

not perform certain actions or as a result of past activities/inactivity of addressee), that forensic experts establish on the basis of special linguistic knowledge and which are important for the case consideration.

At the verbal and non-verbal speech levels, these statements must have an illocutionary component. According to linguistic lexicographic sources, **illocutionary act** is “one of the speech act components involving the embodiment of a certain communicative intention, communicative goal, which gives the statement a corresponding communicative focus; relation of speech to the purpose, motives and conditions of communication; the intention, goal of the addressee in the speech act; speech act aimed at achieving a communicative connection between speech act participants”¹⁶. At the same time, the structure of the statement expressed in the form of a threat must contain a speech goal, that according to its semantic content, expresses a specific direction of the addressee to perform/not perform a certain action (certain actions), or an indication of the onset of negative consequences for the addressee as a result of the addressee’s dissatisfaction with the actions performed / not actions committed by the addressee in the past. Therefore, one of the main factors indicating existence of statements expressed in the form of threats is a semantic conglomerate of persuasive sentences with those containing in their semantics the promise of the task (occurrence) of negative consequences.

15 Кримінальний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/2341-14#Text> (date accessed: 07.09.2022).

16 Загнітко А. Сучасний лінгвістичний словник. Вінниця, 2020. С. 243. URL: https://r.donnu.edu.ua/xmlui/bitstream/handle/123456789/469/%D0%A1%D0%BB%D0%BE%D0%B2%D0%BD%D0%B8%D0%BA_RD-%D0%A1%D1%83%D1%87_%D0%BB%D1%96%D0%BD%D0%B3%D0%B2_%D1%81%D0%BB%D0%BE%D0%B2%D0%BD%D0%B8%D0%BA%20%281%29.pdf?sequence=1&isAllowed=y (date accessed: 07.09.2022).

From the standpoint of linguists, a threat is “*promise to inflict some kind of evil, trouble, intimidation*”, “*the possibility or inevitability of occurrence, occurrence of something dangerous, unfortunate for someone, something. What can do evil is a nuisance.*” The conceptual and meaningful field of the statement, expressed in the form of a threat, logically combines both of above interpretations, that is, the speech act merges the semantics of the promise to cause trouble to the addressee of the message and the occurrence of negative consequences for him, if the conditions of the addressee are not met or when the addressee has already carried out certain actions that contradict the views of the addressee and he expresses his dissatisfaction with this, warning about negative consequences¹⁷.

Important stage in the recognition of the fact of threats is the determination of communicative intensity of interlocutors, because it is the communicative intensity that is the leading component of communicative act organizing. For its part, communicative intensity is a component of the communication strategy depending on various factors of communication, in particular, on the communication context, peculiarities of interlocutors’ characters¹⁸.

Each stage of the communication activity implies the availability of a certain purpose that addresser transmits to the addressee using expressions. In addition, addressee should take such verbal expressions of the subject and purpose of the conversation in advance, so that interlocutor understands him/her, perceives the information, clarifies the communicative purpose, considers the ways and means of performing the

actions that the addressee expects from him/her. Such non-verbal factors should be considered by forensic expert, examining statements at the pragmatic level of speech situation analysis¹⁹.

The threat is a means of targeted communicative behavior of the addressee, aimed at achieving its goals and does not take into account the desire or unwillingness of the addressee to perform specific actions that will lead to the achievement of the addressee’s goal. As practice indicates: often such messages are accompanied by negative, offensive vocabulary, which is mostly expressed in invective, non-normative, lilac words. Usually in this way, the addresser expresses his negative and sometimes contemptuous attitude to the interlocutor, expressing indignation, despair, anger and other markers, which is the embodiment of negative emotions. The use of rough, obscene vocabulary serves as an additional tool for influencing the addressee to perform / not perform the desired action for the addresser. Such statements always reinforce the aggressive nature of the speech act of the threat. Therefore, along with the issue of establishing statements expressed in the form of a threat, it is also advisable to check the text material for availability of negative (offensive, rude, disparaging) information about the addressee.

Speech objects of linguistic semantic-textual examination of speech regarding the establishment of expressions expressed in the form of threats include: texts of SMS messages, e-mails, leaflets, conversations (including telephone), audio and video messages, public speeches, etc. According to the specifics of methodological approaches of linguistic examination of

17 Коротич К. Ор. cit.

18 Шабат-Савка С. Т. Категорія комунікативної інтенції в українській мові : монографія. Чернівці, 2014. 412 с.

19 Бацевич Ф. С. Основи комунікативної лінгвістики : підручник. Київ, 2004. 342 с.

speech, they cannot be expression objects transmitted from the words of other persons (victims, witnesses).

By examining speech constructions, forensic linguist aims to identify factors at both the illocutionary and logical and grammatical, semantic levels that will confirm the version of the presence (or absence) of expressions expressed in the form of threats. In order to achieve this goal, it is desirable to follow the research algorithm, that means the speech object should be analyzed by specific detailed tasks. Thus, the task of linguistic examination of speech is a clear sequence of actions of semantic-textual analysis, as a result of which the expert provides a conclusion.

At the present stage of development of linguistic semantic and textual speech analysis, the following main tasks are distinguished to establish expressions expressed in the form of threats:

- interpretation and clarification of word meaning, phrases, stable phraseological expressions (idioms);
- interpretation of the main and additional values of key speech units (meaningful lexical constructions) in the studied context;
- determining the objective content of the entire speech message and establishing options for understanding the studied constructs depending on the specific communication situation;
- Semantic and textual analysis in order to determine the formal and grammatical characteristics of the object under research, specifics of the stylistic means and techniques used;
- detection of the communicative orientation, modality, expressiveness and emotionality

of speech message (or a fragment thereof);

- determination of specific addressees (addressee) in the speech object under research to which the speaker addresses, or their establishing from the context of speech situation;
- establishing words, phrases, sentences containing semantics of inducing the addressee to perform/not perform certain actions and promising to cause trouble to the addressee in case of refusal to perform these actions; or promising to cause trouble to the addressee as a result of the already performed activity or inaction of the addressee that is unacceptable to the addresser.

Thus, by semantic and conceptual and content analysis of speech constructions (statements, texts) taking into account their objective content, it is necessary to determine that the speech objects under research are expressed (or not expressed) in the form of threat (threats) at both the lexical and grammatical levels.

Forensic expert shall describe and classify the means of threat identified in the provided speech message (text) taking into account research object peculiarities. First of all, he pays attention to the situation of communication (non-spoken context) that is usually described in the document on the appointment of expertise (expert study) or in the case file. This makes it possible to determine the pragmatic orientation of the message under research. At the same time, he studies the stylistic belonging of research object making it possible to find out its structural and systemic features and establish compliance with requirements of a certain functional speech style.

Along with a pragmatic analysis of the situation of communication, the

clarification of the semantics of lexical components that are components of the objects of research plays an important role in determining the speech act of threats in written texts and in oral messages. The arguments for the expert's conclusion regarding the presence of the threat illocutionary act in the object under research are primarily the presence of lexical and grammatical features and not subjective addressee perception of statements made (written) to his address.

Note that forensic expert should distinguish between emotional statements expressed in the form of profanity playing the role of only an expression of addresser's emotional negative attitude to the interlocutor or a particular event. Quite often, such obscene words and phrases are the reaction of a person to a difficult unpleasant situation for him, which creates an emotionally negative connoted time and space. In addition, in other communicative situations, common obscene persistent expressions can verbalize threats. It is for this purpose that forensic expert defines the semantics of the key words and phrases used in the speech message (in particular, he reveals the meaning of hints and metaphors). Particular attention while analysis should be paid to the context of the conversation in general.

Illocutionary acts and threats in statements, where lexemes are used in direct meanings, and sentences in syntactic structure have a full form, are determined on the basis of a general semantic and textual research.

More thorough and focused linguistic analysis requires communicative situations in which incomplete or indirect expressions (phrases expressed in indirect form) are used, where the illocutionary act of threats is determined through speech intents, communicative intentions, subjective-modal verbalizers, etc. In this case, the

research should be carried out on the basis of a pragmatic approach in the discourse of a specific speech situation, taking into account all communicative components (syntactic expression of the illocutionary component, recipient's reaction, volume of phrases expressed, modality of words and phrases, the explication of the addressee's intent, speech strategies and tactics, etc.). Communicative and pragmatic level makes it possible to trace the ability of the addressee to use various speech and non-speech means to express his communicative intention. Sometimes the research is complicated by the fact that the illocutionary act of the threat is not transmitted during communication situation, but is expressed using a short note or SMS message and has a concise form of expression and an indirect character.

The systematization of the main lexical-semantic means of expressing threats in speech contributed to the following conclusion: the addressee can use a variety of lexical means to express illocutionary act of threats that at the denotative level have the meaning of intimidation, warning, threats. At the same time, a pragmatic level of analysis of speech messages, research of the discourse of the speech situation in general is important, since it makes it possible to identify direct and indirect threats of murder, bodily injury, property damage, etc. in speech objects.

Research areas of object content:
a) study of speech context (if fragments of a conversation or a text message that is part of correspondence are provided for the study, the conversation (correspondence) in general is investigated). This makes possible to determine the message addressee, communicative intents of the participants in the communication, confirm or refute the invective nature of statements, etc.;

- b) the establishment of meaningful vocabulary (lexical-semantic analysis) contributes to the objective content clarification of statements, specification of the type of threats (murder, violence, property damage, etc.) or the absence of such semantics in the investigated speech message;
- c) research on expression structure (logical and grammatical analysis) makes it possible to confirm or refute availability in the speech message of the incitement of the addressee to certain activities/inaction in favor of addressee, or allegations of certain behavior of the addressee in the past that harmed the addressee;
- d) comparing research results with the algorithm of linguistic signs of the speech act of threats will help the expert to reach a categorical conclusion about the existence/lack of threats in research object.

Thus, during the linguistic semantic and textual speech analysis, the main is the analysis of the object, which combining lexical and grammatical and pragmatic components. A thorough study of the context of the speech situation, the definition of speech and extralinguistic (non-speech) factors allows forensic expert to conduct comprehensive and complete research, reach a conclusion on the existence/lack of statements expressed in the form of threats.

Conclusions

We see the prospects for development of the methodological foundations of modern semantic and textual speech analysis in expanding the range of tasks and potential opportunities for the use of the latest technologies and new linguistic knowledge in legal field. Development of a theoretical methodological framework

is based on the continuous careful study of practical development. The expert's conclusion based on the results of the linguistic examination of speech is often one of the powerful means for making a court decision, as well as a significant argument during the pre-trial investigation in criminal cases regarding the threat incrimination.

Актуальність лінгвістичної експертизи мовлення у кримінальних справах щодо інкримінування погрози Євгенія Ковкіна, Маргарита Алоян, Ліля Авоян

Статтю присвячено окремим питанням лінгвістичної семантико-текстуальної експертизи мовлення у кримінальних справах щодо інкримінування погрози. Станом на сьогодні засоби погрози, виявлені у наданому на дослідження мовленнєвому повідомленні (тексті), експерт класифікує на прагматичному рівні. На відміну від суто семантичного аналізування висловлювань (коли інформація має стверджувальний характер), прагматичний підхід дає змогу дослідити мовленнєвий акт як виразник волевиявлення особи, її емоцій і почуттів, визначити іллокутивне наповнення повідомлення, установити реакцію адресата на висловлену адресантом інформацію та ін. Мета статті полягає у визначенні ролі лінгвістичної експертизи мовлення у кримінальних справах щодо інкримінування погрози. До об'єктів такої експертизи належать тексти смс-повідомлень, електронних листів, листівок, розмов (зокрема, телефонних), аудіо- та відеозвернень, публічних виступів та ін. Іллокуції погрози у висловлюваннях, де лексеми використано в прямих значеннях, а речення за синтаксичною будовою мають повну форму, установлюють на основі загального семантико-текстуального дослідження. Аналізування потребують

комунікативні ситуації, у яких використано неповні або непрямі висловлювання, тобто фрази, виражені у непрямій формі, де іллокуцію погрози можна визначити через мовленнєві інтенції, комунікативні наміри, суб'єктивно-модальні вербалізатори та ін. Висновок експерта за результатами лінгвістичної експертизи мовлення є одним із потужних засобів прийняття судового рішення і значенням аргументом під час досудового розслідування у кримінальних справах щодо інкримінування погрози.

Ключові слова: дискурс; комунікативна ситуація; лексико-граматичний аналіз; лінгвістична експертиза мовлення; мовленнєвий акт погрози; прагматичний аналіз.

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Declaration of Competing Interest

Authors declare no conflict of interest.

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Specialist's Participation in Crime Scene Reconstruction for Investigating Circumstances of Traffic Collision Occurred in the Dark

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Professional participation (person possessing specific expertise and skills in the use of technical or other means and can provide advice while pre-trial investigation and trial on issues that require relevant specific expertise and skills) in conducting crime scene reconstructions improves the quality of pre-trial investigation, expands possibilities of the parties of criminal proceedings (regarding collection, evidence verification and evaluation), contributes to acceleration, completeness and impartiality of the investigation and trial. General requirements for preparation and conducting of crime scene reconstructions in criminal proceedings for investigation of traffic collisions occurred in the dark, as well as professional functions and the peculiarities of his specific expertise application in such a reconstruction (finding out the mechanism of traffic collision; obtaining data for appointment of road accident analysis; verification of circumstances relevant to

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criminal proceedings). Interaction aspects of pre-trial investigation bodies with professional in the field of road accident analysis while investigation of criminal offenses: traffic collisions are analyzed. The authors aimed to highlight peculiarities of conducting crime scene reconstruction to determine general and specific visibility for investigation of criminal offenses related to violation of traffic safety rules transport operation, applying to achieve the goal methods of formal logic, special legal (primarily: comparative legal) and system analysis.

Keywords: *traffic collision, crime scene reconstruction, specific expertise, professional in road accident analysis, general visibility; specific visibility; output data; forensic road accident analysis.*

Research Problem Formulation

According to Art. 2 of the Criminal Procedure Code of Ukraine ¹, the task of criminal proceedings is, in particular, to ensure a quick, complete and impartial investigation of criminal offenses. Therefore, the task of law enforcement agencies while investigation of criminal offenses related to violation of road safety rules or transport operation is to fully and objectively clarify circumstances and mechanism of road traffic events (hereinafter referred to as traffic collisions), collect sufficient evidence and determining the guilt of the participants of this traffic collision. The pre-trial investigation of this category of criminal proceedings is greatly facilitated by the appropriate specific expertise application, since Part 2 of Art. 240 of the Criminal Procedure Code of Ukraine provides that “*if necessary, an investigative experiment can be conducted with the professional participation*” ².

In Part 2 of Art. 84 of the Criminal Procedure Code of Ukraine ³ the procedural sources of evidence are statements, material evidence, documents, expert conclusions. In addition, the practice of investigating criminal offenses related to violations of traffic safety rules or vehicle operation indicates that due to specifics of this category of criminal proceedings, one of the main sources of evidence is expert conclusion drawn up based on results of road accident analysis. Timely and high-quality examination has a positive effect on the quality of the pre-trial investigation and contributes to legality strengthening. Objectivity and validity of the expert conclusion depend on reliability and admissibility of initial data obtained while crime scene reconstruction. The most serious mistake that has an extremely negative effect on clarification of the mechanism of traffic collision and the initial data for conducting a forensic road accident data for conducting a forensic road accident analysis (respectively, on the course and

1 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та допов.). URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 06.09.2022).

2 Кримінальний процесуальний кодекс України URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 06.09.2022).

3 Ibidem.

results of the pre-trial investigation), is the conduct of unqualified investigative experiments. Unfortunately, specialists (specialists, experts) in the field of automotive research are not often involved in conducting investigative experiments to investigate the circumstances of road accidents. This circumstance, as well as the increase in requirements for the quality of the pre-trial investigation in these proceedings, lead to the need to involve a specialist in the field of auto engineering to participate in investigative experiments to establish the circumstances of the road accident and the initial data, which the expert can later use to conduct a forensic road accident analysis.

One of the most difficult crime scene reconstructions while investigation of criminal offenses related to the violation of traffic safety rules or the operation of vehicles is the experiment to determine visibility in the dark. While conducting a crime scene reconstruction in the dark, certain requirements are put forward to determine visibility, compliance with which will make possible to establish reliable data on general and specific visibility in traffic collision conditions.

In research paper, we will consider issues related to conducting crime scene reconstruction to determine general and

specific visibility while investigation of traffic collision circumstances; determine professional functions and the specifics of the specific expertise application while crime scene reconstruction; we will analyze certain aspects of interaction of pre-trial investigation bodies with professional in the field of road accident analysis while investigation of criminal offenses in connection with traffic collision.

Analysis of Essential Researches and Publications

Separate issues of the theoretical and methodological foundations of conducting crime scene reconstructions in criminal proceedings are covered in the works of: V. P. Kolmakov; M. V. Saltevsykyi; V. Yu. Shepitko; M. G. Scherbakovsyyi; T. M. Balytskyi ⁴; Sh. Sh. Yaramishyan ⁵; O. V. Saushkin, A. A. Khanyants, A. G. Bondarev, and S. V. Sulima ⁶; P. E. Antoniuk; I. V. Pyrih and others. Some specifics of conducting crime scene reconstructions within the framework of the study of issues of forensic expertology were studied by: V. A. Bekasov; V. A. Ilarionov; M. M. Christie; E. P. Lanevskyi, O. M. Gordover and O. I. Ovcharenko ⁷; Yu. G. Kharchenko; N. S. Romanov ⁸; A. M. Turenko and

4 Балицький Т. М. Слідчий експеримент в системі слідчих (розшукових) дій у кримінальному провадженні України : автореф. дис. ... канд. юрид. наук. Ірпінь, 2015. 19 с. URL: <https://dspace.nlu.edu.ua/bitstream/123456789/16881/1/BALITSKY-2015.pdf> (date accessed: 06.09.2022).

5 Ярамисьян Ш. Ш. Особенности следственного эксперимента при расследовании дорожно-транспортного происшествия. *Теорія та практика судової експертизи і криміналістики*. 2004. Вип. 4. С. 162–167.

6 Саушкін О. В., Ханянц А. А., Бондарева А. Г., Сулим С. В. Метод натурного моделювання при проведенні комплексної судово-медичної, транспортно-трасологічної та автотехнічної експертизи. *Ibidem*. 2018. Вип. 18. С. 585–592. DOI: 10.32353/khrife.2018.68 (date accessed: 06.09.2022).

7 Ланевский Э. П., Гордовер А. Н., Овчаренко А. И. Эксперименты по определению видимости при исследовании ДТП, совершенных в темное время суток : метод. рек. Минск, 1987. 30 с.

8 Романов Н. С. Основные положения судебно-экспертного анализа автотранспортного происшествия. Киев, 1969. 67 с.

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and O. S. Shabratko ¹³; S. I. Povalyaev and
A. V. Saraiev ¹⁴.

Article Purpose

Highlighting peculiarities of conducting crime scene reconstruction to determine the general and specific visibility while investigation of criminal offenses related to violation of traffic safety rules or transport operation.

Research Methods

For achieving this goal, the paper used general scientific and special methods that made it possible to take into account the specifics of the object and subject of research in the best possible way, in particular: methods of formal logic (analysis, synthesis, deduction, induction, analogy, abstraction) for

detailed clarification of the content of the issues under consideration; special legal methods (primarily: comparative legal) while analysis of norms of substantive and procedural law, scientific categories, definitions and approaches; method of system analysis in the context of determining the directions of activities to improve the specific expertise application while crime scene reconstruction in the dark.

Main Content Presentation

In current criminal procedure, there are two participants in criminal proceedings possessing specific expertise, namely: *forensic expert* (Art. 69 of the Criminal Procedural Code of Ukraine of Ukraine ¹⁵) and a *professional* (Art. 71 of Criminal Procedural Code of Ukraine ¹⁶). According to paragraph 25 of Part 1 of Article 3 of the Criminal Procedural Code of Ukraine ¹⁷, forensic expert and a professional in the criminal process have the status of

- 9 Туренко А. М., Клименко В. І., Сараєв О. В., Данець С. В. Автотехнічна експертиза. Дослідження обставин ДТП : підруч. для вчн. Харків, 2013. 320 с.
- 10 Лубенцов А. В., Варлахов В. О. Технічний аналіз дій водіїв транспортних засобів на нерегульованих перехрестях під час виконання лівого повороту. *Теорія та практика судової експертизи і криміналістики*. 2020. Вип. 21. С. 411–421. DOI: [10.32353/khrife.1.2020.28](https://doi.org/10.32353/khrife.1.2020.28) (date accessed: 06.09.2022).
- 11 Кошкарів А. Д. Розслідування дорожньо-транспортної пригоди та визначення причинно-наслідкових зв'язків між несправностями транспортного засобу. *Ibidem*. С. 422–431. DOI: [10.32353/khrife.1.2020.29](https://doi.org/10.32353/khrife.1.2020.29) (date accessed: 06.09.2022).
- 12 Ольхов В. С. Визначення причинно-наслідкового зв'язку між неналежним облаштуванням технічними засобами організації дорожнього руху та настанням ДТП. *Ibidem*. 2020. Вип. 21. С. 432–440. DOI: [10.32353/khrife.1.2020.30](https://doi.org/10.32353/khrife.1.2020.30) (date accessed: 06.09.2022).
- 13 Фролов А. А., Шабратко О. С. Дослідження шин вантажного транспортного засобу щодо визначення пошкоджень, які утворилися в результаті експлуатаційного зношення або в результаті заводського дефекту. *Ibidem*. С. 441–451. DOI: [10.32353/khrife.1.2020.31](https://doi.org/10.32353/khrife.1.2020.31) (date accessed: 06.09.2022).
- 14 Поваляєв С. І., Сараєв О. В. Моделювання механізму перекидання транспортного засобу в процесі розвитку дорожньо-транспортної пригоди. *Ibidem*. 2019. Вип. 20. С. 318–326. DOI: [10/32353/khrife.2.2019.24](https://doi.org/10.32353/khrife.2.2019.24) (date accessed: 06.09.2022).
- 15 Кримінальний процесуальний кодекс України URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 06.09.2022).
- 16 *Ibidem*.
- 17 *Ibidem*.

participants in criminal proceedings with corresponding rights and obligations.

Forensic expert in criminal proceedings is a person possessing “scientific, technical or other specific expertise having right in accordance with the Law of Law of Ukraine: On Judicial Examination for conducting a forensic examination and who is entrusted with conducting research on objects, phenomena and processes that contain information about circumstances commission of a criminal offense, and give a conclusion on issues that arise while criminal proceedings and relate to the field of his/her knowledge” (Article 69 of the Criminal Procedure Code of Ukraine)¹⁸. Thus, forensic expert is a person who has specific expertise and is the subject of a forensic examination.

According to Art. 71 Criminal Procedural Code of Ukraine:

“1. Specialist in criminal proceedings is a person who possesses specific expertise and skills and can provide consultations, explanations, references and conclusions during pre-trial investigation and hearing on matters requiring relevant specific expertise and skills.

2. Specialist may be engaged to provide direct technical assistance <...> by the parties to criminal proceedings during the pre-trial investigation and hearing <...>”¹⁹.

The difference between the activity of an expert in the field of auto technical research, engaged by the investigator as a specialist, and the procedural activity of the expert is that specialist participates in investigative actions, applying his specific expertise and skills to assist the investigator in gathering evidence.

Specialist involved in an investigative experiment has certain procedural rights and obligations, procedural legal relations with other participants in criminal proceedings and performs his actions in accordance with procedural legislation²⁰.

In accordance with Part 4 of Art. 71 of the Criminal Procedural Code of Ukraine, the specialist has the right:

“1) ask questions to procedural action participants with the permission of the party to the criminal proceedings that involved him or the court;

2) use technical means, devices and special equipment;

3) draw the attention of the party to criminal proceedings that involved him, or the court, to the characteristic circumstances or specifics of things and documents;

3¹) state in the conclusion information that is important for criminal proceedings and he was not asked questions about;

4) get acquainted with protocols of procedural actions which he participated in, and submit comments to;

5) receive remuneration for performed work and reimbursement of expenses related to his involvement in criminal proceedings;

6) submit a request for security in cases provided for by law;

7) provide conclusions on issues that belong to his field of knowledge, during the pre-trial investigation of criminal misdemeanors, including in the cases provided for by the third part of Article 214 of this Code;

8) provide certificates on issues that belong to his field of knowledge, in the cases

18 Кримінальний процесуальний кодекс України URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 06.09.2022).

19 Ibidem.

20 Терехов Г. А. Процессуальные положения и полномочия специалиста в уголовном процессе. Проблемы судебной автотехнической экспертизы : сб. науч. трудов. Москва, 1987. С. 94–113.

provided for by the third part of Article 2451 of this Code”²¹.

In accordance with Part 5 of Art. 71 of the Criminal Procedural Code of Ukraine, the specialist has the right:

“1) to arrive upon summons to the investigator, inquirer, prosecutor, court and have with you the necessary technical equipment, devices and instruments;

2) comply with instructions of the party to criminal proceedings that involved him or the court and give explanations on asked questions;

3) not to divulge information that directly relates to essence of criminal proceedings and the procedural actions carried out (carried out) during it, and which became known to the specialist in connection with the performance of his duties;

4) declare self-recusal in the presence of circumstances provided for by this Code”²².

In practice, assistance of specialists to the subject investigation (investigator, prosecutor) is specified by the following tasks:

- participation in monitoring correct implementation of conditions for conducting a crime scene reconstruction, i.e., ensuring adequacy of the criteria for comparing circumstances that require clarification or verification;
- participation in choosing from among characteristics and parameters that check them,

those reflect essential specifics of investigated circumstance or fact (taking into account the task of the investigative (search) action, data from special literature and own experience);

- taking into account the maximum possible range of changes in certain circumstances and characteristics;
- scientific, technical and advisory support for experimental verification of circumstances;
- participation in elucidating nature, regularities and stability of the connection between previously determined reliable and obtained reconstruction parameters of the analyzed situation²³.

Specialists help the investigator at all stages of crime scene reconstruction: to identify key points and identify dangerous moments for participants' health; reproduce the environment and conditions of conducting experiments, as close as possible to criminal offense event; develop a plan, organize experiments and monitor their implementation; to assist in the selection of analogues, production of mock-ups and dummies, the selection of vehicles; evaluate the results obtained in the process of conducting an investigative experiment. During an investigative experiment, a specialist has the right to take measurements, take photographs, make sound or video recordings, draw up

21 Кримінальний процесуальний кодекс України URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 06.09.2022).

22 Ibidem.

23 Антоноук П. Є., Антошук А. О., Пясковський В. В., Саковський А. А., Самодін А. В., Таран О. В., Терещенко Ю. В. Тактика проведення слідчого експерименту під час досудового розслідування : метод. рек. Київ, 2021. 68 с. URL: <http://elar.naiu.kiev.ua/jspui/bitstream/123456789/18811/1/%D0%9C%D0%B5%D1%82%D0%BE%D0%B4%D0%B8%D1%87%D0%BD%D1%96%20%D1%80%D0%B5%D0%BA%D0%BE%D0%BC%D0%B5%D0%BD%D0%B4%D0%B0%D1%86-%D1%96%D1%97%20%D0%A1%D0%BB%D1%96%D0%B4%D1%87%D0%B8%D0%B9%20%D0%B5%D0%BA%D1%81%D0%BF%D0%B5%D1%80%D0%B8%D0%BC%D0%B5%D0%BD%D1%82.pdf> (date accessed: 06.09.2022).

plans and diagrams, make graphic images of a place or individual things, as well as prints and casts.

Study of the investigation practice of criminal offenses provided for by Art. 286 of the Criminal Code of Ukraine²⁴, namely during the investigation of a traffic collision, indicates that one of the main and most often performed investigative actions is the investigative experiment itself. A distinctive feature of conducting investigative experiments in this category of criminal proceedings is that most of the time they cannot be carried out without the use of vehicle, which are sources of increased danger (in particular, on road sections with the most intensive traffic and its interruption or closure can cause negative consequences). As a result, there are additional requirements for the preparation and planning of this investigative action, taking into account the need to involve additional forces and means to ensure its implementation in the shortest possible time. An investigative experiment is not conducted if there are factors that may threaten the life or health of the persons participating in it or others. Also, the conduct of this investigative action should not harm someone else's property, humiliate the honor and dignity of its participants, violate public safety and moral standards (Part 4 of Article 240 of the Criminal Procedure Code of Ukraine²⁵). Use of the specialist's knowledge in the field of road accident analysis during crime scene reconstruction will allow to fully determine the traffic collision mechanism and

characterizing parameters, in compliance with the methodological approaches' customary in expert practice.

During investigation of traffic collision circumstances occurred at dark time of the day, the main questions are: 1) regarding the correspondence of the speed chosen by the driver to visibility conditions of roadway elements; 2) regarding the driver's technical ability to avoid an accident in conditions of limited visibility. In order to answer these questions, expert practice followed the path of experimental determination of visibility in the conditions of road accidents. In forensic road accident analysis, concepts of *general visibility* and *specific visibility*²⁶ are distinguished. General visibility is the distance from the front of the vehicle, at which from the driver's seat it is possible to clearly distinguish the elements of the road in the path of movement, the orientation of which allows driving the vehicle in the lane recommended by the Traffic codes²⁶. *Specific visibility* is the distance from the front of the vehicle at which the obstacle can be clearly recognized from the driver's seat by its specifics²⁷.

Number and staff of participants in the experiment to clarify traffic collision circumstances are determined by the investigator, prosecutor, who are the subjects of investigation, taking into account the crime scene reconstruction conditions. These are the persons provided for by the Criminal Procedural Code of Ukraine (suspect, victim, witness, defender, representative: Part 3

24 Кримінальний кодекс України від 05.04.2001 р. № 2341-III (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/2341-14> (date accessed: 06.09.2022).

25 Кримінальний процесуальний кодекс України URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 06.09.2022).

26 Правила дорожнього руху : затв. Постановою КМУ від 10.10.2001 р. № 1306 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/1306-2001-%D0%BF#Text> (date accessed: 06.09.2022).

27 Ланевский Э. П., Гордовер А. Н., Овчаренко А. И. Оп. cit.

of Article 240)²⁸, as well as persons who should ensure the conducting crime scene reconstruction (police officers who forbid drivers of motor vehicles who are not its participants). Witnesses (at least two persons) are involved in crime scene reconstruction provided during this investigative action, continuous video recording is not used (otherwise, witnesses may not be involved in accordance with paragraph 1, part 7, Article 223 of Criminal Procedural Code of Ukraine²⁹).

It is known that the ability of a driver involved in traffic collision to distinguish between the boundaries of the roadway and a certain obstacle depends on purely subjective factors, such as visual acuity, age, fatigue, state of health, etc. It is practically impossible to accurately determine totality impact of these factors on visibility in the process of conducting crime scene reconstruction. Therefore, persons who determine the visibility from the driver's seat during crime scene reconstruction should have sharp vision and color perception, acceptable for persons driving motor vehicle.

Effectiveness and evidentiary value of crime scene reconstructions to determine visibility depends on maximum approximation of road, weather and other conditions to those that occurred at the time of the accident. The main conditions, given the impossibility of reconstructing them, are weather and road conditions. With low probability of stable weather conditions (rain, snow, fog, etc.), maximum efficiency is required in the preparation and conduct of the experiment to determine the visibility. In this case, it is appropriate to conduct the experiment immediately after inspecting the scene. Objects that were not there before traffic collision

(parked vehicles and other objects) should be removed from the road. If the section of the road has changed significantly after the event, and there are sections similar to the site of the accident near of the accident site, then it is possible to conduct crime scene reconstruction.

Crime scene reconstruction results in many respects depend on the speed with which the vehicle caused the accident was moving, but to take this factor into account crime scene reconstruction is, firstly, almost impossible, and secondly (and this is the most important), the experiment in this case becomes dangerous. The vehicle movement speed which visibility is determined from should be minimal, because the vehicle should be stopped as soon as possible to measure the general and specific visibility. Movement at a minimum speed is also necessary in order to receive a signal about onset of visibility not only from the observing driver, but from witnesses.

Most often, crime scene reconstruction for determining visibility is carried out on the section of the road where the traffic collision occurred. Under the circumstances mentioned above, it is considered possible to conduct crime scene reconstruction in areas similar to the area where the accident occurred. In all cases, the crime scene reconstruction is limited to a place that allows the actual experiment to be conducted (for example, other vehicles moving on the road should be stopped at such a distance that the light of external lighting devices does not affect visibility in the experimental area). For the coordination of investigative actions, it is necessary to provide portable means of communication (walkie-talkies, telephones) to workers who are on the borders of the experiment area (the investigator and the

28 Кримінальний процесуальний кодекс України URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 06.09.2022).

29 Ibidem.

driver of the oncoming vehicle in the case when visibility is determined taking into account the light of the headlights of the oncoming vehicle), which allows to quickly to adjust the course of the experiment, as well as to stop it if necessary, let shuttle buses, operational vehicles, etc., and generally ensure the safety of the participants of crime scene reconstruction. A vehicle involved in traffic collision at night often suffers significant mechanical damage (in particular, external lighting devices). In this case, the vehicle should be replaced with the same type, paying special attention to: compliance of external light devices for headlight adjustment; type and power of lamps; degree of contamination of headlight glass; condition and degree of contamination of the front glass of the cabin and other factors that may affect visibility. It is necessary to pay attention to the elements that can affect the visibility and recognition of obstacles (reflective elements, license plates, rear lights with reflective elements, reflectors, contrasting markings on the walls of obstacles, etc.).

When recreating the road situation with a collision with a person lying on the road, the mannequin (dummy) should be dressed either in the clothes of the victim, or in clothes similar in appearance and color. It is worth noting that, for example, snow could be thrown from a person's clothes as a result of a collision, or vice versa (due to body movement: rolling, dragging); these clothes could be covered with snow or road dirt, or dirtied by car tires during movement.

Equipment necessary for conducting crime scene reconstruction on visibility (except for communication devices): a tape measure (10-20 m), a red or white reflector, electric flashlight, chalk for marking the roadway or easy-to-install numbered chips (from 1 to 8; up to 3 sets).

Reliability and admissibility of initial data obtained during crime scene

reconstruction depends on the preparatory measures for its preparation. They are carried out by the investigator, prosecutor, both before the departure (exit) to the place of the investigative experiment and directly at this place, but before commission of investigative actions. Crime scene reconstruction is a complex investigative action requiring a responsible attitude to management of crime scene reconstruction and requires careful consideration of possible implementation options. Preparation and conducting crime scene reconstruction should, firstly, criminal procedure requirements, since the results obtained without complying with requirements of the law during crime scene reconstruction will not have evidentiary value; secondly, during the investigative experiment, the investigator must adhere to the methodical approaches used in expert practice for determining visibility in the dark which ensure the completeness and objectivity of the results. The latter is possible if a specialist is involved in crime scene reconstruction. In general, three aspects of preparation for conducting crime scene reconstruction can be distinguished: *managerial, procedural and tactical* ones.

Depending on the type of traffic collision and preceded circumstances, different methodological approaches are used to determine the general and specific visibility in the dark during the crime scene reconstruction. Next, we will consider the stages of conducting crime scene reconstructions to determine general and specific visibility.

If traffic collision occurred in lack of oncoming vehicle headlights, preparatory stage includes measures regarding: selection of crime scene reconstruction participants, vehicle participated in traffic collision and the obstacle that was hit (vehicle, extra pedestrian, mannequin, etc.); agreement

on the time of crime scene reconstruction; reconstruction of the experiment site; ensuring investigative actions.

The crime scene reconstruction run to determine visibility in the event of hitting a stationary obstacle is described below. After the area where the experiment is conducted is fenced off with police posts and the necessary work is carried out to reconstruct the scene of the accident, a pedestrian-extra (a mannequin in the clothes of the victim or similar in type and color) is placed at the place of the collision. The vehicle from which visibility will be determined is placed in front of the collision site at a distance from which the pedestrian-extra (dummy) cannot be seen. The vehicle should move in the same lane as during the accident. From their place, the driver-observer and bystanders determine the place to which the road can be seen (for example, border of the right edge of the carriageway with a shoulder). If the roadway is marked in the form of broken lines, it is enough to count the number of lines visible from the driver's seat and measure the distance from the front of the vehicle to the last visible line. If the right border of the carriageway and the shoulder is visible for a greater distance than the longitudinal marking, and also if there is no longitudinal marking, then visibility of the road is determined by the distance at which the right border of the carriageway and the shoulder is still visible. The distance of general visibility can be determined by visible road posts of the fence. Visibility of road signs or other structures, marked or not marked with vertical markings, does not always make possible to reach a conclusion about the direction and width of the carriageway, therefore, questions about general visibility, taking into account the visibility of road signs and structures, are decided in each case separately. To determine the place to which the border of the right edge of the carriageway with the

curb can be seen from a standing vehicle, one of the participants of the experiment carries a reflector along the right border of the carriageway at a height not exceeding 15-20 cm, periodically turning it active side to the observer driver. Focusing on the flashes of the reflector, the driver-observer stops the person with the reflector in a place where the border of the carriageway and the side of the road can be seen, after which the distance from the front of the vehicle to this place is measured: this is the distance of general visibility, or the visibility of the road in the direction of movement of the vehicle. Instead of a reflector, it is possible to use a sheet of white paper. Carrying the sheet 15-20 cm above the edge of the carriageway, it is periodically turned back to the driver-observer: the driver-observer does not see the sheet in the position of the driver-observer, in the other position - he sees it. By focusing on the sheet, the driver-observer is able to monitor the location of the person carrying the sheet and gives the command to stop at the place where the border of the carriageway and the roadside can be seen (in winter, you should choose a sheet contrasting in color with the snow cover, yellow-hot , green). The need for a traffic light or a piece of paper, as practice shows, is caused by the fact that a person moving away from a vehicle becomes invisible to the observing driver, so he cannot stop him in a place where the border of the carriageway and the road side can be seen.

The vehicle (after determining the specific visibility distance) moves at a speed of 3-4 km/h in the direction of the obstacle (dummy). The driver-observer stops the vehicle in a place from which the obstacle can be recognized by external signs (silhouette, contours of legs, elements of clothing, etc.). After measuring the distance from the front part of the vehicle to recognized object (dummy), we will get the specific visibility distance of this object from the driver's seat.

Experiments to determine specific visibility of other stationary obstacles (in the absence of light from the headlights of oncoming vehicles) are not very different from crime scene reconstruction described above.

In the case of a vehicle hitting a moving obstacle, the preparatory stage is carried out in the same way as above, supplemented by the determination of the distances that the vehicle and the moving obstacle cover in 1 s. The path that a moving obstacle covers in 1 s is most often determined experimentally (with the help of a stopwatch and a section of a certain length), simulating the pace of the obstacle movement adjusted by event eyewitnesses. Further from the place of impact in the direction opposite to the direction of movement of the motor vehicle, on the path of its movement, sections equal to the distance that the motor vehicle covers in 1 second are marked. A sufficient number of such plots, as practice demonstrates is 5 (sometimes there may be more). In this case, the course of the investigative experiment is as follows. The vehicle and the moving obstacle are placed in the positions of section 5: the vehicle with its front part at the border of the section (usually the collision occurs with the front part), and the moving obstacle at level of primary contact with the vehicle at the time of collision. General and specific visibility

are determined from this position. Next, the vehicle and the obstacle are moved to the border of section 4. In this case, the overall visibility is determined if it is affected by a change in road conditions (for example, a transition from uphill to downhill, a change in the radius of the road, condition of the road surface, etc.). On straight and flat sections of the road, general visibility usually does not change much. By successively moving the vehicle and the obstacle on the border of sections 3, 2 and 1, determine the distance of specific visibility (see Fig. 1).

If the obstacle can be detected when the vehicle is between different sections (for example, between sections 2 and 3), then this section should be divided in half, corresponding to a distance of 0.5 s (or into 4 parts, corresponding to a distance of 0.25 s), and subsequent movements of vehicles and obstacles should be carried out not on the entire site, but on its corresponding components for a more accurate determination of specific visibility distances.

If the accident occurred in availability of oncoming vehicle headlights, then (in addition to the above) it is necessary to find out some additional information:

1) *in relation to the opposing vehicle:*

a) vehicle type (car or truck, tractor, motorcycle, etc.),



Fig. 1. Visibility determination of in lack of oncoming vehicle headlights

- b) movement velocity
- c) location in relation to carriageway boundaries during its movement,
- d) characteristic of the switched-on light (high beam, low beam, headlamps, searchlight, etc.).

If there were several oncoming vehicles, then specified information should be available about each of them, as well as determine the distance between;

2) *in relation to collided vehicle:*

- a) movement velocity
- b) characteristic of the switched-on light,
- c) location in relation to carriageway boundaries during its movement,
- d) collision site location in relation to carriageway boundaries and longitudinal landmarks,
- e) departure location with oncoming vehicle.

At the site of crime scene reconstruction, previously fenced off by police stations, a stationary obstacle is set up at the impact location. A line or chips mark the place of departure (place where the front parts of the departing cars were on the same line). Taking into account the speed of the oncoming vehicle (V_1 ; for example, 60 km/h) and collided vehicle (V_2 ; for example, 40 km/h), determine the distances they cover per 1 s: $V_1 - 16.6$ m/s;

$V_2 - 11,1$ m/s. Sections of the path in 1 s for the vehicle that collided are marked from the collision site in the direction opposite to its movement. After marking done in this way, it is possible to determine the time spent by the vehicle that collided with the road from the point of departure to the point of collision. Evidently, the oncoming vehicle was moving from the departure point at the same time; its position at the moment of collision will be determined depending on the speed of its movement. Therefore, front part of the oncoming vehicle at the time of collision will be at a certain distance behind the departure line. From this point, in the direction opposite to the direction of movement of the oncoming vehicle, sections from 1 to 5 are marked. During the experiment, the oncoming vehicle and the vehicle that collided are placed with their front parts on the boundaries of section 5 on the same lanes in which they were moving (positions according to 5 with before hitting). Taking into account the light of the vehicle's headlights, the distance of general visibility from the place of the driver of the vehicle that collided is determined. Most often, it is impossible to see the obstacle at this moment. Next, the vehicle is moved to sections 4, 3, etc. and again determine general and specific visibility (*see Fig. 2*).

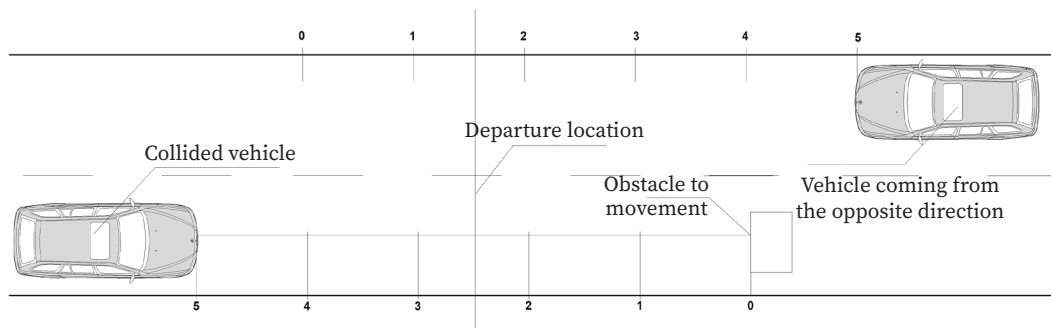


Fig. 2. Visibility determination in lack of oncoming vehicle headlights

Specific visibility under these conditions is determined similarly, namely: as under lack conditions of light from oncoming vehicle headlights.

If there are several vehicles, then they should be moved, keeping a distance from the vehicle which crime scene reconstruction is being conducted for. If a change in the mode of operation of external lighting of any of the vehicles is found at some points on the way of convergence of vehicles, this circumstance should be taken into account during the investigative experiment.

In the case of hitting moving objects without braking, it is necessary to manage vehicle movement and determine specific visibility in the above way, taking into account the speed of the object hit. If before the collision, vehicle was moving in a braked state with the formation of braking traces, then more complex calculations than those indicated above should be performed to determine its location at different moments of time; in this case, it is advisable to conduct investigative experiments to determine visibility only with the participation of road accident analysis specialist.

Conclusions

The above indicates that a quick and high-quality pre-trial investigation is possible only if the conducted crime scene reconstruction meets the requirements stipulated by the criminal procedure and the methodical approaches used in expert practice for determining visibility in the dark are observed. Crime scene reconstruction, conducted with the involvement of a specialist in the field of road accident analysis, ensures compliance of specified investigative action with methodological recommendations for their conduct and has a positive effect on the quality of the pre-trial investigation.

Участь спеціаліста в слідчому експерименті із дослідження обставин дорожньо-транспортної пригоди, яка відбулася в темний час

Віталій Варлахов, Олександр Свідерський, Валентина Мітуневічус

Участь спеціаліста (особи, яка має спеціальні знання й навички застосування технічних або інших засобів і може надавати консультації під час досудового розслідування й судового розгляду з питань, які потребують відповідних спеціальних знань і навичок) у проведенні слідчих експериментів поліпшує якість досудового розслідування, розширює можливості сторін кримінального провадження (щодо збирання, перевірки й оцінювання доказів), сприяє пришвидшенню, повноті й неупередженості розслідування та судового розгляду. Досліджено загальні вимоги до підготовки та проведення слідчих експериментів у кримінальних провадженнях із розслідування дорожньо-транспортних пригод, які сталися темного часу доби, а також функції спеціаліста й особливості застосування ним спеціальних знань у такому експерименті (з'ясування механізму пригоди; здобуття даних для призначення судової автотехнічної експертизи; перевірка обставин, що мають значення для кримінального провадження). Проаналізовано аспекти взаємодії органів досудового розслідування зі спеціалістом в галузі автотехнічних досліджень під час розслідування кримінальних правопорушень — дорожньо-транспортних пригод. Автори мали на меті висвітлити особливості проведення слідчого експерименту із визначення загальної та конкретної видимості для розслідування кримінальних правопорушень, пов'язаних із порушенням правил безпеки дорожнього руху або експлуатації транспорту, застосувавши для досягнення поставленої мети методи формальної логіки, спеціально-правові (передусім — порівняльно-правовий) і системного аналізу.

Ключові слова: дорожньо-транспортна пригода; слідчий експеримент; спеціальні знання; спеціаліст у галузі автотехнічних досліджень; загальна видимість; конкретна видимість; вихідні дані; судова автотехнічна експертиза.

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Declaration of Competing Interest

Authors declare no conflict of interest.

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Research on Braking System of Electric Cars while Forensic Road Accident Analysis

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c Project administration.

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Issues resolved by forensic road accident analysis regarding technical malfunctions (and their causes) of the vehicle braking system in case of traffic collision considered. The methods, purpose and tasks of such a research and braking parameters of electric cars are analyzed. Possible consequences of malfunctions of vehicle braking system are identified and the ways of further traffic collision investigation after determining braking coefficients for electric cars are outlined. The purpose of this article is to justify the need to supplement the braking coefficients with indicators for electric cars while forensic road accident analysis for the investigation of traffic collisions that will ultimately contribute to improving quality and reducing the time required for forensic examination by forensic automotive examiners to examine cars with electric or hybrid power units. In order to achieve the goal, visual, metric, experimental, graphical analysis and instrumental research methods were used. The

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results of this scientific investigation were the development of a new direction of research in the field of forensic road accident analysis where the research object are cars with electric and hybrid power units, solving issues about the technical possibility of preventing traffic collisions involving electric cars and coordinating cooperation with investigative bodies during the examination.

Keywords: *technical condition of vehicle; vehicle operation; traffic accident; brake system malfunctions; electric car; hybrid vehicle installation.*

Research Problem Formulation

With increase in the number of electric cars on domestic roads, the number of traffic collisions has increased. While road accident analysis, namely the selection of tabular output data of parameters and braking coefficients, the expert cannot independently choose these coefficients, since the braking parameters of electric vehicles have not been fully investigated to date. Therefore, quite often, for the selection of initial data during the study of the brake system of an electric vehicle, forensic expert is forced to submit a request to investigative bodies or the court to conduct crime scene

reconstruction that extends forensic examination deadline.

Analysis of Essential Researches and Publications

Issues arising while investigation of traffic collision occurred as a result of a malfunction of the brake system of electric cars were studied by such scientists as: O. F. Sytovskiy and V. M. Dembytskyi ¹; O. M. Kashuba ²; O. I. Sablin, V. H. Kuznetsov and V. V. Artemchuk ³; K. Popiołek, T. Detka, K. Żebrowski, K. Małek ⁴. The analysis of the mentioned research papers indicates use effectiveness of recuperation systems on cars with an electric system; and not

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- 1 Ситовский О. Ф., Дембицкий В. М. Электродинамическое торможение гибридного транспортного средства на дорогах с низким коэффициентом сцепления. *Автомобильный транспорт*. 2013. № 33. С. 13–18.
 - 2 Кашуба А. М. Рекуперация кінетичної енергії в автомобілях з гібридною силовою установкою. *Наукові нотатки*. 2011. Вип. 35. С. 93–95. URL: http://nbuv.gov.ua/UJRN/Nn_2011_35_17 (date accessed: 04.09.2022).
 - 3 Саблін О. І., Кузнецов В. Г., Артемчук В. В. Проблеми та перспективи ефективного використання рекуперації електроенергії в системі електротранспорту. *Оптико-електронні інформаційно-енергетичні технології*. 2013. № 2. С. 126-130. URL: http://nbuv.gov.ua/UJRN/oeiet_2013_2_25 (date accessed: 04.09.2022).
 - 4 Popiołek K., Detka T., Żebrowski K., Małek K. Analysis of Regenerative Braking Strategies. *Przegląd Elektrotechniczny*. 2019. R. 95. NR 6. Pp. 117–123. DOI: [10.15199/48.2019.06.21](https://doi.org/10.15199/48.2019.06.21) (date accessed: 04.09.2022).

only for the purpose of reducing energy consumption.

Article Purpose

Justify the need to supplement braking coefficients with indicators for electric vehicles during the forensic road accident analysis of traffic collision investigation that will ultimately contribute to improving quality and reducing the terms of forensic examinations by forensic automotive examiners on research of cars with electric or hybrid power units.

Research Methods

In order to achieve this goal, visual, metric, experimental, graphical analysis and instrumental research methods were used.

Main Content Presentation

Road accident analysis, which is a kind of engineering and transport expertise, is important for the consideration of cases of accidents. Forensic road accident analysis has its own scientific base, forensic automotive: integration industry based on engineering and forensic knowledge about patterns of occurrence of accidents and the methodology of their research.

According to Instruction on appointment and conducting forensic examinations and researches⁵ (hereinafter referred to as *Instruction*), the main tasks of the auto technical examination are:

- determination of vehicle malfunctions that threatened traffic safety, their causes and time

of occurrence (before, while, or after traffic collision possibility of detecting malfunctions using established methods of monitoring the technical condition of vehicles; determination of the mechanism of the influence of malfunction on occurrence and development of traffic collision;

- elucidation of traffic collision mechanism and its elements (speed of movement (following traces of braking and damage), braking and stopping distances, trajectory of movement, distance traveled by motor vehicle in certain time intervals and other spatial and dynamic characteristics of the motor vehicle accident: speed of movement of the motor vehicle, taking into account their damage, can be determined with the help of software complexes for researching traffic collision mechanism, recommended for implementation in forensic practice);
- identification compliance of actions of the motor vehicle driver in a specific road situation with the technical requirements of Traffic codes⁶ whether the driver has the technical ability to prevent an accident from the moment of danger, compliance of the driver actions (from a technical point of view) with requirements of Traffic code, as well as establishing a cause-and-effect connection between driver actions and the accident.

5 Інструкція про призначення та проведення судових експертиз та експертних досліджень : затв. наказом Мініюсту України від 08.01.1998 р. № 53/5 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z0705-98> (date accessed: 21.06.2022).

6 Правила дорожнього руху : затв. Постановою КМУ від 10.10.2001 р. № 1306 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/1306-2001-%D0%BF> (date accessed: 02.06.2020).

When a driver fails to stop the car in time, he usually cites brake failure. Unfortunately, it is not always possible to investigate in detail the chain of events and circumstances which caused the collision that is often associated with impossibility of stopping in time. Therefore, it is very useful for forensic expert to know the most common causes of traffic collisions associated with brake system malfunctions, namely:

- uneven braking;
- partial or temporary brake failure;
- loss of frictional properties;
- heat distribution;
- air in brake system;
- expansion of brake drum;
- brake amplifier;
- partial failure of brake systems with a separate hydraulic actuator, etc.⁷

Brake system is a set of devices designed to create and change artificial movement resistance. While diagnosing brake system, it is necessary to evaluate how these devices (each separately and their totality in general) meet design and requirements of manufacturing plant, as well as the efficiency and operability of their action ⁸.

Checking the brakes is the most important of performance checks of car systems that affect traffic safety performed during the operation of the vehicle. Therefore, performance indicators of brake systems, their permissible values and inspection regimes are regulated by regulatory documents — as national as international one. These documents can be divided into two types:

- 1) some make demands for the products of the automobile industry that have just come off the factory conveyors;
- 2) other to cars that are already in operation.

Car developers build such possibilities in the design of brake systems which would be guaranteed to meet requirements of industry standards. The latter are quite high in order to prevent deterioration of technical condition of the brakes during operation. The limit of this deterioration is determined by operational standards based on the requirements of domestic traffic laws.

Thus, the upper limit of steady deceleration laid down by designers can be 9-10 m/s² for passenger cars, the industrial standard will be approximately 7-8 m/s², operational standard will be within 5-6 m/s². The latest requirements are criteria for patrol police officers and road transport companies that service cars and monitor their technical condition.

Having recognized the need to conduct an examination, the investigator, in accordance with the requirements of Criminal Procedural Code of Ukraine ⁹, issues a resolution on this, stating:

- grounds for appointment of forensic examination; name of institution where forensic examination is to be conducted and/or forensic expert surname;
- materials provided to forensic expert;
- raw data which the research should be based on;
- issues to be resolved.

7 Байэтт Р., Уоттс Р. Расследование дорожно-транспортных происшествий. Москва, 1983. 288 с.

8 Жилинский Г. В., Остапюк О. Я., Лошманов В. П. и др. Экспресс-диагностика систем автомобилей и автобусов на местах дорожно-транспортных происшествий / под ред. А. Б. Разумова. Киев, 1980. 56 с.

9 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та допов.). URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 02.06.2020).

In criminal proceedings, to resolve issues that require specific expertise in the field of road accident analysis (in accordance with Article 110 “Procedural decisions”, 242 “Grounds for conducting forensic examination”, 243 “Procedure for engaging forensic expert” of Criminal Procedural Code of Ukraine ¹⁰), a forensic road accident analysis is appointed.

During road accident analyses, there is often a need to assess technical condition of those systems (their individual units, assemblies or parts) on which traffic safety depends to the greatest extent. Such systems include: brake system, steering, external lighting devices, wheels and tires. Various methods can be used to check the technical condition of aggregates, assemblies, and parts of vehicles, among which the following are the most common in forensic expert practice:

- running tests;
- bench tests (diagnosis);
- elemental research.

In some cases, it is necessary to carry out forensic multidisciplinary examinations to identify the causes of malfunctions of individual parts. A vehicle (its individual units, assemblies or parts) is considered technically serviceable if its actual condition in all structural and operational parameters of functioning meets the requirements of regulatory and technical documentation. At the same time, it is worth noting that not every malfunction leads to a malfunction. In addition, the failure of a specific node or unit may not be causally related to traffic collision occurrence.

In Ukraine, since January 1, 1999, the ДСТУ standard 3649-97 *Road vehicles. Operational safety requirements for technical condition and control methods* to replace the previously valid interstate standard ГОСТ 25478-91 (hereinafter referred to as ДСТУ 3649-97) of the Soviet period. From July 1, 2011, ДСТУ 3649-97 was replaced by ДСТУ 3649:2010 *“Wheeled vehicles. Requirements for the safety of the technical condition and methods of control”*, which providing for two types of inspection of working brake system:

- road tests;
- bench tests ¹¹.

Road tests should be carried out under the following conditions: on a dry and level section of a clean road with a hard surface (cement or asphalt concrete), in the state of empty weight of the vehicle, with the driver and measuring devices (if necessary, with the test operator), with “cold” brakes mechanisms (the temperature of parts of which are connected to friction surfaces does not exceed 100 °C). The initial braking speed V_0 should be between 35 and 45 km/h. The force on the brake pedal (or other working brake system control body) should not exceed 490 H for vehicles of categories M_1 and N_1 and 686 H for vehicles of other categories. While braking, the driver is not allowed to adjust the vehicle trajectory unless it is necessary to ensure movement. If the movement trajectory needs to be adjusted, the test results are not accepted.

Vehicle performance can be evaluated according to the criterion of the value of the established deceleration of the vehicle ($j_{\text{уст}}$), that should be at least 5.8 m/s² for

10 Кримінальний процесуальний кодекс ... URL: <http://zakon2.rada.gov.ua/laws/show/4651-17> (date accessed: 02.06.2020).

11 ДСТУ 3649:2010 Колісні транспортні засоби. Вимоги щодо безпечності технічного стану та методи контролювання : затв. наказом Держспоживстандарту України від 28.12.2010 р. № 630. [Чинний від 01.07.2011]. URL: <https://patrul.in.ua/pdf/dstu-3649.pdf> (date accessed: 02.06.2020).

vehicles of category M_1 , and 5.0 m/s^2 for the rest (taking into account road trains based on vehicles of category M_1). In addition, it is necessary to control the activation time of the brake system, which for trucks with a hydraulic drive should not exceed 0.5 s , and for trucks with another drive – 0.8 s .

Brake system activation time (τ_c) is determined by the Ukrainian standard ДСТУ 2886-94¹² as the time interval from the start of braking to the time when the deceleration (braking force of the vehicle) becomes constant.

The impact of brake system malfunctions on occurrence of an event is usually manifested in extreme conditions, when the vehicle driver is forced to use maximum functional capabilities of the system to prevent harmful consequences (collision, collision, etc.). Under such conditions, the driver uses emergency braking to stop the vehicle at a minimum distance. In emergency braking mode (depending on the technical condition of the braking system and the road surface), blocking of all wheels, only rear or front, left, right or single wheels may occur. Driving a vehicle while braking in the wheel lock mode in certain road situations can cause an accident¹³.

Vehicle should be considered technically defective if its technical condition does not meet the requirements

of Sec. 31 “Technical condition of vehicles and their equipment” (clause 31.4.1 “Brake systems”) of the Traffic Act, as well as if there are other defects in the brake system that make it impossible to ensure road traffic¹⁴.

The actions of the driver should be considered as non-compliance with the requirements of Traffic codes, if he operates a motor vehicle with brake system malfunctions, which he was aware of, and which he should have discovered during vehicle operation.

The electric car is a fairly new concept in the world of the automotive industry. The use of traditional braking systems on electric vehicles is extremely inefficient¹⁵. As is well known, while braking with friction brakes, mechanical energy is converted into thermal energy, which is dissipated into the environment. The use of the recuperation system makes it possible to save part of the energy spent on the movement of an electric vehicle¹⁶. In this way, the mileage on one battery charge increases. As well, with this type of braking, friction linings are practically not used in brake mechanisms extending their service life.

Electric cars and hybrid cars have two brake systems:

- conventional with friction brake mechanisms and hydraulic actuator;

12 ДСТУ 2886-94 Автотранспортні засоби. Гальмівні властивості. Терміни та визначення : затв. наказом Держстандарту України від 09.12.1994 р. № 312. [Чинний від 01.07.1996]. URL: http://online.budstandart.com/ua/catalog/doc-page.html?id_doc=68772 (date accessed: 02.06.2020).

13 ДСТУ 3649:2010 ... URL: <https://patrul.in.ua/pdf/dstu-3649.pdf> (date accessed: 02.06.2020).

14 Правила дорожнього руху ... URL: <https://zakon.rada.gov.ua/laws/show/1306-2001-%D0%BF> (date accessed: 02.06.2020).

15 Ruan J., Walker P. D., Watterson P. A., Zhang N. The dynamic performance and economic benefit of a blended braking system in a multi-speed battery electric vehicle. *Applied Energy*. 2016. Vol. 183. Pp. 1240–1258. DOI: [10.1016/j.apenergy.2016.09.057](https://doi.org/10.1016/j.apenergy.2016.09.057) (date accessed: 02.06.2020).

16 Heydari S., Fajri P., Lotfi N., Falahati B. Influencing Factors in Low Speed Regenerative Braking Performance of Electric Vehicles. *IEEE Transportation Electrification Conference and Expo (ITEC)*. 13–15 June 2018. Long Beach, CA, USA. DOI: [10.1109/ITEC.2018.8450260](https://doi.org/10.1109/ITEC.2018.8450260) (date accessed: 02.06.2020).

- Regenerative braking system.

In the hydraulic actuator, a fluid is used as the working body, supplied under pressure to the brake cylinders actuating brake mechanisms.

Vehicles such as the *Tesla Model S* and the *Toyota Prius* hybrid use a regenerative braking system. Recovery is the process of returning part of energy for reuse in the same process.

While pressing brake pedal, recuperative system first gains strength in other words, instead of a friction brake mechanism, electric generator creates artificial resistance to the rotation of the wheels. Effective maximum braking torque of a traction motor operating in generator mode depends not only on the excitation current, but also on the armature rotation frequency, which depends on the vehicle speed. Therefore, effectiveness of braking varies depending on the movement speed. In case of insufficient braking efficiency by traction electric motor, the difference between the efficiency level set by the driver and the efficiency level created by the electric motor is compensated by the friction braking mechanism. The higher the amperage (which the electric motor produces in generator mode) of the high-voltage battery charge, the less effort the driver needs for the braking process.

Successful regenerative braking control is achieved through joint control of the brake system and transmission. With this control, regenerative brake system and the hydraulic brake system provide total brake force. At the same time, fluctuations in recuperative system parameters caused by the degree of charge of the battery or the speed of the vehicle are balanced. As

a result, loss of kinetic energy is reduced to a minimum.

Electricity recovery during the braking of electric vehicles is a strong source of reduction in the energy intensity of the electric traction system. Modern technical base makes it possible to smoothly adjust the braking force almost to the vehicle stop.

The vehicle design with the use of electric braking with energy recovery practically does not require the installation of an additional brake system. However, in fact, the vehicle is equipped with a hydraulic brake system. Consequently, the process of braking a vehicle with an electric motor, in addition to the usual system with friction brake mechanisms, is supplemented by another component: electric braking. In this way, active safety of the vehicle is increased.

Currently, there are two types (categories) of regenerative braking systems that are defined in European regulations¹⁷.

- *category A*: electric regenerative brake system that is not a component of working brake system;
- *category B*: electric regenerative braking system that is a component of the working brake system.

The main difference between these two categories of braking systems is the way they are actuated. If activation of the regenerative braking system of category A occurs at the moment of changing the force of pressing the accelerator pedal, then regenerative braking system of category B is also activated by bringing the accelerator pedal to the zero position and turning on the service brake system. In the case of application of the category B recuperation

17 Regulation No 13 of the Economic Commission for Europe of the United Nations (UN/ECE) – Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking [2016/194]. URL: <https://op.europa.eu/en/publication-detail/-/publication/0a43f880-d612-11e5-a4b5-01aa75ed71a1/language-en> (date accessed: 01.06.2022).

system, electric motor most often produces electrical energy while coasting¹⁸.

The main issue is that at long distances, the use of recovery system becomes practically useless, since vehicle mostly moves in acceleration mode and braking is only a small, insignificant part of the total time. This makes energy recovery while braking insufficiently efficient, which makes charging an acid battery inefficient and structurally electricity network is much more complicated¹⁹. That is why the regenerative braking system is mainly used on hybrid vehicles, where the use of this system achieves 30% savings in the total energy required to drive the vehicle²⁰.

Having received the resolution (decision) on forensic examination appointment, forensic automotive examiner acquaints himself with its content, studies the traffic collision schedule as it is submitted by the investigator (court), and the questions to be answered. Then the expert analyzes criminal case materials of the and systematizes them in a sequence convenient for the future study. He recreates sequence of events during traffic collision and the actions of its participants. According to the resolution (decision) and the case file, he builds an approximate model of the investigated traffic collision.

During the preliminary research at the preparatory stage of the forensic road accident analysis, forensic expert carries out certain actions that can entail the return of forensic examination materials to the initiator for their proper registration. Thus, after reading the materials, forensic expert:

- ascertains packaging integrity and availability of research object, their compliance with the list in the accompanying documents;
- studies the state of research objects (their integrity, lack of changes caused by transportation, etc.);
- establishes sufficiency and quality of the obtained materials, research objects;
- comes to the conclusion makes a decision on the need to violate the petition for the provision of additional materials and samples and other actions related to examination;
- determines necessary set of research methods and sequence of their application.

Direct forensic research is an expert's indisputable competence. However, without detracting from the independence of the expert, it is worth noting the need for active participation in this process by the investigator, who is interested in high-quality and efficient research, the use of the latest technologies and achievements of science and technology, and the preservation of the researched object for conducting another research (for example, re-examination). In particular, at the initial stage of conducting a forensic investigation, the investigator and the expert together determine the task of the appointed examination, essence of the questions posed to forensic expert, the real terms of the investigation, jointly check the materials received for examination, their packaging. At this stage, forensic expert can notice the shortcomings

18 Ситовский О. Ф., Дембицкий В. М. *Op. cit.*

19 Kanarachos S., Alirezaei M., Jansen S. T. Adaptive Regenerative Braking for Electric Vehicles with an Electric Motor at the Front Axle using the State Dependent Riccati Equation Control Technique. *WSEAS Transactions on Systems and Control*. 2014. Vol. 9. Is. 2. Pp. 424–447. DOI: [10.1177/0954407013498227](https://doi.org/10.1177/0954407013498227) (date accessed: 01.06.2022).

20 Кашуба А. М. *Op. cit.* URL: http://nbuv.gov.ua/UJRN/Nn_2011_35_17 (date accessed: 04.09.2022).

present during the seizure of materials presented for research, provide advice on their elimination while working with other physical evidence.

The direct performance of the auto technical examination begins with clarifying the content and nature of the questions put to the expert, as well as with the study of actual data about the traffic collision and its separate moments. According to Para. 4 Clause 2.3 Ch. II “Rights, Duties and Responsibilities of Forensic Expert” of Instructions, forensic expert is forbidden to “*independently collect the materials to be examined, as well as select the initial data for the examination, if they are ambiguously reflected in the provided materials*”²¹. Therefore, if forensic expert, after studying materials at his disposal, comes to the conclusion that some of the facts (events, circumstances) described in the resolution (resolution) on appointment of forensic expert conclusion could not have taken place from a technical point of view, i.e., are technically impossible, he should report this is the investigator (court) and request new materials necessary for the investigation. At the same time, forensic expert has the right to independently use information from normative and reference sources regarding the design and operational vehicle parameters, quantitative indicators of the actions of traffic participants (for example, the driver’s reaction time), characteristics of traffic conditions recommended for practical use by the methods valid at the time of conducting a forensic examination.

While conducting research, forensic expert can establish data about which the investigator (judge) does not ask in the

decision (ruling) on forensic examination appointment which are important information and evidence for the case.

When forensic expert receives a case in which the object of the study is an electric car, and the expert is asked to solve a question about the technical possibility of preventing an accident by means of emergency braking, the expert cannot independently choose the output data based on the braking parameters of this electric car, since they differ to some extent from tabular data included in the generally known scientific literature on this issue. Therefore (in accordance with paragraph 3, clause 2.1, chapter II of the Instructions), the expert sends a request to the investigative bodies or the court for the provision of additional data²²: in this case, the initial data on the braking parameters of the electric vehicle under investigation. After that, investigative bodies (in administrative proceedings: the parties to the case) should carry out certain measurements on this electric car. Most often, a decelerometer (decelerograph) VZM 300 is used to obtain such data.

The VZM 300 decelerometer is designed for road braking tests (deceleration registration, braking distance calculation) complete with a built-in printer. It is possible to connect a force meter on the brake pedal and a pressure sensor in the pneumatic brake system. The decelerometer VZM 300 meets the requirements of the *German Traffic Regulatory Statutes (StVZO)*. According to the regulations 71/320/EWG (replaced by the regulations 98/12/EG) effectiveness of the braking system is determined by measuring the average sustained deceleration. The decelerometer VZM 300 calculates the average permanent

21 Інструкція про призначення та проведення судових експертиз ... URL: <https://zakon.rada.gov.ua/laws/show/z0705-98> (date accessed: 21.06.2022).

22 Інструкція про призначення та проведення судових експертиз ... URL: <https://zakon.rada.gov.ua/laws/show/z0705-98> (date accessed: 21.06.2022).

deceleration for one measurement based on the official requirements of ISO/TR 13487:1997²³. In addition, use of VZM 300 in this case meets the requirements of 71/320/EWG²⁴. The error of the constant deceleration values and the deceleration growth time obtained using the VZM 300 device, according to its technical characteristics, does not exceed 0.1 m/s². The VZM 300 decelerometer is equipped with a built-in “beak” compensation during braking, which makes it easier to measure the time and document the deceleration of the vehicle during braking. A maximum of 7 graphs with 1000 points each or 14 graphs with 500 points each can be stored in the device memory.

The measured values are displayed on a 2×16-digit LCD display and can be printed out digitally or graphically. It is also possible to transfer data to a personal computer using one of the built-in digital interfaces.

The power source of the VZM 300 decelerometer is a built-in battery, but it can also be powered by the car on-board network (12/24 V).

However, forensic expert cannot receive a response to the expert’s request for additional information within 45 calendar days, so the expert should perform an examination in the number of materials submitted for research or send a notice of impossibility to conduct an examination (paragraph 4.10 of the Instruction²⁵), which will extend the terms of forensic examination.

Conclusions

Considering the above, it can be concluded that brake systems on cars with internal combustion engines and on electric cars have differences in their structure. During performance of road accident analyses, forensic expert uses commonly known table data with braking parameters of “traditional” cars. In the case of researching road accidents involving cars with electric motors, there is a problem with the selection of output data (time of activation of the brake actuator, time of growth of deceleration, constant deceleration, etc.), since cars with electric motors during braking reduce the speed of movement not only with the help of a traditional brake system, and also with the help of electric motor braking. When finding out the cause-and-effect relationship between road accidents involving electric vehicles and the technical ability of the driver to stop the car he is driving, forensic expert has the right to use only those data on braking parameters that he receives during the investigative experiment. As of today, the Register of Forensic Examinations does not contain methods for researching braking parameters of electric cars and hybrid cars. With the aim of shortening the time period for performing road accident analysis (in particular, due to the fact that the expert will not submit a request for the provision of additional initial data on braking parameters of cars with electric motors), it is necessary to

23 ISO/TR 13487 Braking of road vehicles – Considerations on the definition of mean fully developed deceleration /European Standards. URL: <https://www.en-standard.eu/iso-tr-13487-braking-of-road-vehicles-considerations-on-the-definition-of-mean-fully-developed-deceleration/> (date accessed: 21.06.2022).

24 Richtlinie 71/320/EWG des Rates vom 26. Juli 1971 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die Bremsanlagen bestimmter Klassen von Kraftfahrzeugen und deren Anhängern /EUR-Lex. Access to European Union law. URL: <https://eur-lex.europa.eu/legal-content/DE/TEXT/?uri=celex%3A31971L0320> (date accessed: 21.06.2022).

25 Інструкція про призначення та проведення судових експертиз ... URL: <https://zakon.rada.gov.ua/laws/show/z0705-98> (date accessed: 21.06.2022).

develop new methods for determining braking parameters of electric cars.

Given the rate of growth in the number of transports with electric power units in Ukraine, this type of brake system is not yet sufficiently studied, and this opens new prospects for further relevant and latest scientific and methodological research in the field of forensic road accident analysis.

Дослідження гальмової системи електромобілів під час проведення автотехнічної експертизи

Владислав Федорченко,

Павло Хоробрих, Лешек Вечорек

Розглянуто питання, розв'язувані автотехнічною експертизою щодо технічних несправностей (і їх причин) гальмової системи транспортного засобу в разі дорожньо-транспортної пригоди. Проаналізовано методи, мету й завдання такого дослідження та параметри гальмування електромобілів. Виявлено можливі наслідки несправностей гальмової системи транспортного засобу й окреслено шляхи подальшого розслідування дорожньо-транспортної пригоди після визначення коефіцієнтів гальмування для електромобілів. Мета статті — обґрунтувати необхідність доповнення коефіцієнтів гальмування показниками для електромобілів під час проведення судової автотехнічної експертизи з розслідування дорожньо-транспортних пригод, що зрештою сприятиме підвищенню якості та зменшенню строків виконання експертами-автотехніками судових експертиз із досліджень автомобілів з електричними або гібридними силовими агрегатами. Для досягнення поставленої мети застосовано візуальні, метричні, експериментальні, графоаналітичні й інструментальні методи дослідження. Результатами цієї наукової розвідки стали розроблення нового напряму досліджень у галузі судової автотехнічної експерти-

зи, де об'єктом дослідження є автомобілі з електричними й гібридними силовими агрегатами, розв'язання питань щодо технічної можливості запобігти дорожньо-транспортній пригоді за участю електромобілів та узгодження взаємодії зі слідчими органами під час виконання експертизи.

Ключові слова: технічний стан транспортного засобу; експлуатація транспортного засобу; дорожньо-транспортна пригода; несправності гальмової системи; електромобіль; гібридна установка транспортного засобу.

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Participants

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Declaration of Competing Interest

Authors declare no conflict of interest.

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Influence of Anti-Lock Braking System on Driving Car, Principle of its Operation in Critical Situation

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Authors aimed to determine the structure and principle of operation, advantages and disadvantages of the anti-lock system, as well as the level of safety of the car in case of its use for the application of the obtained data in the forensic auto-technical examination. Up to 70 % of accidents occur when drivers use the emergency braking mode, up to 60 % are accompanied by loss of stability and controllability. The car's braking system must create braking torques on the wheel axles, which allow the driver to control the speed of the vehicle and bring it to a standstill. As a result of the friction of the surfaces of the interacting elements (some are kinematically connected to the wheels, the other to the fixed elements), braking moments occur thanks to friction braking mechanisms. Disc and drum brakes are the most common brake mechanisms of modern cars. The task of the anti-lock braking system is to maintain controllability during emergency

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braking. In the best case, the car slides straight, in the worst an uncontrolled trajectory with unpredictable consequences. The latest anti-lock braking system is a complex electronic braking design, the basis for other systems: anti-skid, electronic stability control, emergency braking assistance. Anti-lock braking systems are currently installed on cars and trucks, motorcycles, trailers, tractors, even on the wheeled landing gear of airplanes. Car manufacturers and car owners have appreciated effectiveness of active safety system at any time of the year. Legislative bodies of various countries encourage car manufacturers to install anti-lock braking systems on all cars.

Keywords: anti-lock system; car; vehicle; brakes; braking; road surface; road safety; road accident analysis.

Research Problem Formulation

Safety is one of the most important operational properties of the vehicle. Its structural elements, assemblies and systems should prevent the accident as much as possible, and in the event of a traffic accident (hereinafter referred to as *traffic collision*) to minimize its consequences. Measures to solve this problem are divided into those related to passive and active safety. *Passive safety* of modern cars is a variety of assistants and systems that can prevent an accident and exclude and/or reduce the severity of the consequences of an accident without the use of active actions by road users, *active safety* is the same, but due to the active actions of such participants.

Surprisingly, many traffic collisions occur because of the vehicle highly effective braking systems: emergency braking causes the wheels to lock completely, resulting in a loss of traction between the wheels and the road, vehicle

becomes unmanageable and does not respond to the driver's futile attempts to correct the situation that eventually causes accident.

Determination of the braking performance of vehicles equipped with *Anti-lock braking system*, (hereinafter hereinafter referred to as ABS) is one of the issues of modern road accident analysis.

Analysis of Essential Researches and Publications

Research papers of O. N. Turenko, V. I. Klimenko, V. A. Bogomolov, L. A. Ryzhikh, D. N. Leontiev, A. N. Krasiuk, O. F. Sitovskiy, Ya. M. Nefediev, V. O. Petrov, M. O. Petrov, I. K. Pchelin, O. O. Revin, O. O. Severin, B. S. Falkevich, S. Ya. Khodyriev, M. Burkhardt, J. Grabowski, R. C. Hallett, T. Ho, H. Koester, H. Leiber, M. Mitschke, A. Schlichenmaier, D. Schmidt, H. Schramm, P. Wiegner, H. Wolff¹, and other authors are dedicated to ABS making and research on.

1 Див., напр.: Туренко А. Н., Клименко В. И., Богомолов В. А., Рыжих Л. А., Леонтьев Д. Н., Красюк А. Н., Михалевич Н. Г. Реализация интеллектуальных функций

Thus, V. I. Klymenko studied problematic issues of assessing effectiveness of braking vehicles equipped with ABS. L. A. Ryzhykh, A. N. Krasiuk and D. N. Leontiev studied the latest ABS, algorithms of work and their implementation on modern cars.

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Article Purpose

Determine the structure of the ABS, the principle of its operation and operational requirements for it, as well as the level of safety of the vehicle if it is used for the application of the acquired data in the forensic automotive examination.

Main Content Presentation

ABS has been developed and refined for several decades – from its invention to its application, so the literary work (scientific and theoretical, research and development, instructional and journalistic, etc.) on this topic is quite significant. Various types of ABS have been created to improve system performance during sudden braking. Therefore, it is important to define for each vehicle type (depending on its purpose) the individual ABS options and its settings. It should be noted that the most rational values of the setting parameters can be set only by a comprehensive technical and economic analysis, which considers the design and performance characteristics of the vehicle.

ABS is an electronic system that prevents wheel locking, loss of control and contributes to the stability of the vehicle during braking².

The main mistake in thinking about ABS functionality is the confidence that ABS is needed to reduce the vehicle's braking distance. In fact, its main purpose is to preserve the ability to drive while braking, even in an emergency.

It is not always possible to stop the vehicle quickly on locked wheels due to friction. This depends on the type of pavement, the condition of the tire tread.

If the steerable wheels lose traction, the vehicle (despite the driver's attempts to steer them) will move inertially in the same direction as before locking the wheels, causing the vehicle to skid uncontrolled. This is often the case when the wheels on the right and left sides of the vehicle are driven by a heterogeneous road surface. In this case, passive braking helps. However, in emergency cases, it is quite difficult, and sometimes impossible, to control the force and frequency of depressions on the brake pedals. It is in such cases ABS does everything for the driver.

The main feature of ABS is that it can be connected to the brake system even of an outdated car. Most commonly, the ABS is a kit that is simply attached to the brake line and electrical system of the vehicle.

Modern ABS contains a rather small number of elements (see Figure 1):

- wheel rotation speed sensors. Such devices are installed on all wheels. Most often they work according to the Hall sensor principle;
- signal lamp;
- electronic control unit (hereinafter referred to as ECU). Without it ABS will not work because a control unit is required to collect information and activate the system. In some vehicles, each system has its own ECU, but manufacturers often install one unit that handles all elements of the active safety system. The ECU analyzes the parameters that come from each of these sensors. Based on the received data, ECU independently activates or deactivates the system;

2 Гузь М., Сінько В., Марченко В. Найважливіше про антиблокувальну систему гальм. *Agroexpert*. 2017. Вип. № 1 (78). URL: <https://agroexpert.ua/naivazlivise-pro-antiblokuvalnu-sistemu-galm/> (date accessed: 27.05.2022).

- actuators. In the classical version, these elements are a unit with a set of valves, pressure accumulators, pumps, etc.

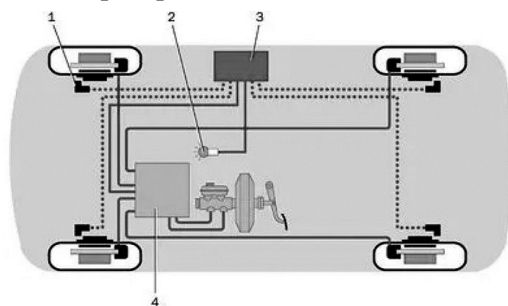


Fig. 1. ABS Circuit Diagram
Passenger Car Sensor: 1 – Sensor wheel rotation speeds, 2 – signal lamp, 3 – electronic control unit (ECU), 4 – actuating device

Whether the most important elements of ABS are wheel speed sensors. According to their pulses, the speed of each wheel is calculated, comparing it with the speed of the vehicle. Based on this information, the ABS module calculates and holds the slip of each wheel at the required level. The ECU receives a signal from the sensors and controls the operation of the valves. Once braking begins, the ABS starts to continuously and accurately determine the rotational speed of each wheel. If that one wheel (or several wheels or all wheels) starts (starts) to slow down its rotation speed (faster than the calculated maximum speed of deceleration of the car, which is calculated separately for each model at the design stage and refined during tests on the surface with the maximum coefficient friction),

then, taking into account the data from the accelerometers, the system gives a command to the pressure modulator in the brake line, which limits the braking force on the wheels. As soon as the rotation of the wheel will correspond to the real speed of movement (rest friction force will be restored), the braking force will be restored. This process is repeated several times (or several tens of times) per second. The operation of the system leads to a noticeable pulsation of the brake pedal: it is by this sign that the driver can determine the moment of ABS³ activation.

The ECU orders are executed by the modulators of the hydraulic unit, which contain two valves on the solenoid hydraulic base, located on each wheel. The first valve is responsible for the access of brake fluid from the main brake cylinder to the wheel through the main line and, if necessary, overlaps it. The second valve shuts off the path from the main line to the brake fluid reservoir, which is the excess fluid accumulator. The frequency of the modulator varies from 4 to 17 Hz. In case one of the wheels is locked, the ECU starts to control the valves so that the fluid supply to the wheel master cylinder is temporarily stopped. If these actions are not enough, the accumulator comes to the rescue, which reduces the pressure in the wheel cylinder due to the lack of liquid. When the accumulator is completely filled with brake fluid, a special electric pump pumps it back into the main line.

In the case of non-lock braking, the solenoid valve connects the wheel cylinder to the corresponding section

3 Гузь М., Сінько В., Марченко В. Оп. cit. URL: <https://agroexpert.ua/naivazlivise-pro-antiblokuvalnu-sistemu-galm/> (date accessed: 27.05.2022).

of the master cylinder and the brake system operates normally. If the *ECU* detects a tendency to lock the wheel, the solenoid valve moves to a position that disconnects the wheel brake cylinder from the master brake cylinder and, conversely, connects to the drain line. The fluid flows into the damping chamber, and then the pump pumps it into the brake master cylinder. The pressure in the wheel cylinder decreases. In the phase of holding the pressure, the electric valve is moved to the position where all lines are disconnected. The next phase of pressure build-up is carried out by moving the electric valve to its initial position. Fluid from the master brake cylinder flows back to the wheel cylinder. In the event of a pump failure, anti-lock braking stops, but the brake actuator remains functional.

When the vehicle is braked in a straight line, the vehicle is subjected to different forces: vehicle weight, braking force and lateral force. The magnitude of the forces depends on a variety of factors, including: the speed of the vehicle and the size of the wheels, the condition of the road surface and the design of the tires, the arrangement and technical condition of the brake system.

Hydraulic unit is sometimes referred to as a brake pressure modulator. **Modulation** is the process of periodically braking and unbraking the wheels. The *ABS* driver senses the operation of the systems as intermittent brake thrusts until the system is able to cope with the threat of wheel lock. *ABS* is activated when the brake pedal is depressed at a speed above 15 km/h considered to be the minimum.

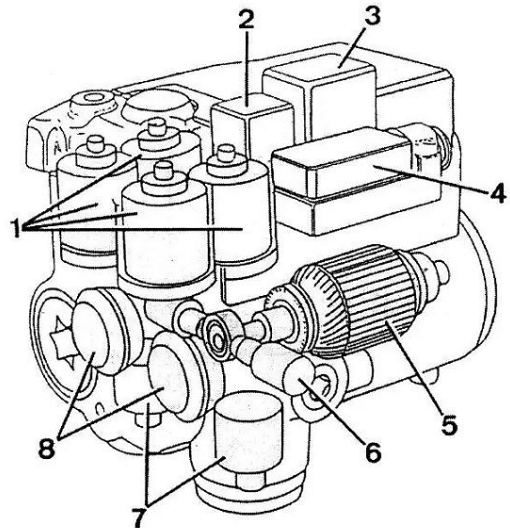


Fig. 2. Electro-hydraulic modulator: 1 – solenoid valves, 2 – hydraulic pump relays, 3 – solenoid valve relays, 4 – electrical connector, 5 – electric pump motor, 6 – pump piston element, 7 – pressure accumulator, 8 – silencer

The ABS can be operated in a two-phase or three-phase cycle.

According to two-phase cycle:

- first phase is the build-up of pressure.
- second phase is pressure relief.

According to the three-phase cycle:

- first phase is the build-up of pressure.
- second phase is pressure relief.
- third phase is to maintain the pressure at a constant level.

If installed on a passenger car, the *ABS* is closed and the brake actuators are open. Open or open brake actuator (high-pressure actuator) has an external energy source in the form of a high-pressure hydraulic pump (usually in combination with a hydraulic accumulator).

Braking force can be limited both in the whole brake system at the same time (single-channel ABS) and in the side brake system (*double-channel ABS*) or the individual wheel (multi-channel ABS). Single-channel systems provide effective braking, but only when the coupling conditions of all wheels are approximately the same⁴.

Thanks to improvements in active security systems, four variants of ABS can be distinguished:

- *single-channel* system. The signal to the control unit and back is simultaneously sent via a single conductive line. Most often, it is equipped with front-wheel drive machines, installing only on leading wheels. This system is triggered regardless of which wheel is locked. This modification has one inlet valve (hydromodulator) and one outlet valve. It also uses one sensor;
- *two-channel* system. In such modifications, the so-called on-board system is used, in which the right side is controlled separately from the left side. This modification has proven to be quite reliable: in the event of an emergency, the car is brought to the side. The right and left wheels end up on different surfaces, so the ABS must give different signals to the actuators;
- *three-channel* system. This modification can safely be called a hybrid of the first and the second. In such ABS, the rear brake pads are controlled by a single channel, as in the first case, and the front

wheels operate according to the principle of on-board ABS;

- *four-channel*. As of today, this is the most effective modification. It has an individual sensor and a hydromodulator for each wheel. The ECU controls the rotation of each wheel, ensuring maximum grip on the road.

Multi-channel systems have the advantage of being able to control the braking force on each wheel individually, which gives not only effective deceleration but stability of the vehicle behavior in difficult conditions of uneven adhesion of the wheels to the road surface⁵.

The complexity of the technical execution does not extend to the principle of operation of this system. When the driver depresses the brake pedal, brake fluid begins to affect the brake mechanisms of the wheels. Brake forces occur at the point of contact of road wheels with the road surface. If you continue to press the pedal, the braking effect increases, however, only up to a certain point. If you increase the braking pressure further, you should not expect positive results, since the wheels simply lock, their rotation stops, and the slip — on the contrary — increases, although the influence of the braking forces remains at the same level, as a result of which the vehicle becomes almost impossible to control. ABS does everything necessary to ensure that the driver avoids such a development. The ABS control unit, after receiving the signals from the sensors and comparing them, commands the distribution valve to reduce the fluid pressure in the brake system (regardless of how hard the driver presses the brake pedal). It is important in the principle of

4 Гузь М., Сінько В., Марченко В. Оп. cit. URL: <https://agroexpert.ua/naivzlivise-pro-antiblokuvalnu-sistemu-galm/> (date accessed: 27.05.2022).

5 Ibidem.

ABS operation that the system individually determines the braking of each wheel that blocks. When the situation is stabilized and the possibility of locking has passed, the brake fluid pressure is normalized to avoid insufficient braking of the wheels.

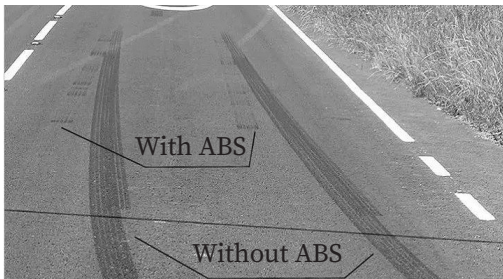


Fig. 3. Difference in braking with and without ABS

The brake dynamics of the vehicle largely depend on the installation pattern of the ABS elements on the vehicle and the chosen principle of adjustment. The most commonly used principles of wheel slip adjustment are:

- *Individual Regelung* (hereinafter referred to as *IR*);
- low-threshold adjustment, which provides for the issuance of commands for the braking and braking of both wheels of the axle simultaneously on the signal of the wheel sensor, which is in worse clutch conditions (*Select Low*, hereinafter referred to as *SL*);
- high-threshold wheel adjustments of the same axle, when the signal is given by the wheel sensor, which is in better grip conditions (*Select High*, hereinafter referred to as *SH*);
- modified individual adjustment (*Modifizierte Individual Regelung*, hereinafter referred to as *MIR*) is a compromise regulation between

SL and *IR*. The *MIR* sense is that *SL* is first regulated and then the transition to *IR*. *MIR* It is advisable to use while braking on the bearing surface with a shear clutch under the left and right wheels, as well as on a turn and transverse slope.

The *IR* is optimal to ensure the best braking performance (minimum braking distance). For this purpose, a speed sensor and a pressure modulator are placed on each wheel and their parameters are adjusted by a separate control channel in the electronic unit. The *IR* gives the optimum braking torque on each wheel according to the road conditions and, as a result, the minimum braking distance. However, if the wheels of the same axle are in different hitching conditions, the braking forces on them will not be the same either.

In some conditions, ABS operation may increase the braking distance. For example, in the case of vehicle tires with insufficient traction (e.g. in winter on summer tires). In order to be able to brake effectively in such conditions, ABS on some vehicles is made controllable. In addition, some types of ABS have a special braking algorithm for a plump surface, which leads to many short-term wheel locks. This braking technique achieves effective deceleration without loss of control (as with full locking) ⁶.

On a vehicle without ABS, in the event of emergency braking by an inexperienced driver, the steering wheels will lock, which means that turning the steering wheel in either direction will not affect the vehicle's trajectory: it will continue to move until the front leading wheels regain their adhesion to the surface. The ABS solves this problem by continuously

6 Гузь М., Сінько В., Марченко В. Оп. cit. URL: <https://agroexpert.ua/naivazlivise-pro-antiblokuvalnu-sistemu-galm/> (date accessed: 27.05.2022).

monitoring wheel rotations and unlocking them as needed, ensuring that they rotate: in this way, it retains the necessary grip on the road, while allowing braking and performing maneuver.

Another fundamentally important function of ABS is to provide safe, uniform and straight-line braking on surfaces with inhomogeneous grip. For example, if one side of the vehicle is hit by a wet surface, a slippery line of markings, or ice, and the other is driven on a fairly clean asphalt, emergency braking without ABS will cause one side to brake more effectively than the other: eventually the vehicle will spin in an uncontrolled skidding. This is especially dangerous when driving in a corner. The difference in braking performance of the wheels in this case easily disturbs the balance. However, the statement about the usefulness of ABS for reducing the vehicle braking distance is correct, but only partially. On surfaces with uniform and sufficient grip of the coated wheels, braking with the wheels locked will be less effective than braking without locking the wheels, and the braking distance in the former case will often be longer. In this case, the use of ABS really reduces the braking distance, preventing the wheels from sliding on the surface. A car with ABS has a reduced tendency to aquaplaning (sliding when driving on wet roads).

However, in conditions where there is sand, gravel or loose snow on the road surface, the use of ABS extends the braking distance. Under such a coating, the shortest braking distance is provided by locked wheels. A wedge of soil is formed in front of each wheel, which shortens the braking distance. In the ABS of the latest generation, this shortcoming is eliminated: the system automatically

determines the nature of the road surface and implements its braking technology for each specific case. This situation can also be observed on ice, when studded tires are installed on the car. The spikes slow the car down the most when they get stuck in the ice. ABS tries to brake the wheels, does not allow the studs to work as efficiently as possible, therefore increases the braking distance. At the same time, availability of ABS is not a reason to refuse studded tires. When locked, the studs will still be in contact with the ice, providing better deceleration than tires without spikes. Issues with the use of ABS can occur on uneven roads and in the event of a malfunction of the shock absorbers or an unadjusted suspension of the car. If during braking one wheel hangs in the air for a moment and locks, then the electronics will apply emergency measures and start saving the car from skidding, reducing the pressure in the rest of the highways. As a result, the car becomes uncontrollable, and the braking distance increases. In such cases, the guarantor of adequate ABS operation is a serviceable suspension ⁷.

Sometimes there is a situation when at the beginning of movement on a slippery road, the drive wheels begin to slip. **Wheel-spin** is an increase in the number of revolutions of one of the leading wheels due to the lack of traction of the tire with the road. In order to slow down the wheel, you need to connect the brake system, so the *Automatic Slip Regulation*, hereinafter referred to as ASR) always works in tandem with ABS. Structurally, this is implemented by placing the ASR solenoid valves inside the ABS. At the same time, placement in the same housing does not mean that these systems duplicate each other. In ASR, other tasks are to equalize the angular

7 Гузь М., Сінько В., Марченко В. Оп. cit. URL: <https://agroexpert.ua/naivazlivise-pro-antiblokuvalnu-sistemu-galm/> (date accessed: 27.05.2022).

velocities of both driving wheels by locking the differential and adjusting the torque. This system provides three types of operation: control of the braking system of the driving wheels, control of the engine traction and a combined type (when two methods are used at once).

If the car is moving at a speed that does not exceed 80 km/h, then ASR having detected the rotation of a wheel faster than the others, slows it down with the means of the braking system. If the speed exceeds this limit, then the speed of rotation of such a wheel decreases due to the reduction of the torque of the power unit transmitted to it. The combination of these methods is considered the most effective and is used when the car moves at a fairly high speed. ASR operation is controlled by a special electronic unit. It receives signals from many sensors that monitor the most important parameters of the car's operation. This information is processed by the software embedded in the block: as a result, control signals are formed, which are transmitted to the executive devices in real time.

ASR is a version of ABS with advanced functionality, therefore (in addition to the sensors, modulators and control unit, that are the main components of ABS brakes) it contains:

- return pump;
- electromagnetic valves
- signal generation module for engine control unit.

The return pump is used to create additional pressure in the brake system: when it turns on, it begins to perform the functions of the master brake cylinder. Solenoid valves are responsible for

connecting this pump and, when the moment comes, for releasing excess pressure. The signal generation module for the engine control unit is used if the ASR works in the power unit torque reduction mode.



Fig. 4. The difference in driving on a difficult section of the road between a car with and without the ASR system

One of the main advantages of ASR is that it prevents the car from skidding when cornering when driving on wet or icy roads. If it is not possible to completely avoid a skid, the system significantly reduces its possible range and therefore the danger of an accident.

We will present the results of driving tests (while road accident analysis) to determine the effectiveness of the working brake system of a car equipped with ABS. The research was carried out in accordance with the requirements of ДСТУ EN ISO/IEC 17025:2019 ⁸: straight section of road with a dry and clean asphalt concrete surface, *Mercedes-Benz Sprinter* with tire rubber *Laufenn X Fit Van*. tires was chosen for driving tests (control runs). The car was accelerated to a speed of 40 km/h, after which the driver applied emergency braking.

8 ДСТУ EN ISO/IEC 17025:2019 Загальні вимоги до компетентності випробувальних та калібрувальних лабораторій (EN ISO/IEC 17025:2017, IDT; ISO/IEC 17025:2017, IDT) : прийнято наказом ДП «УкрНДНЦ» від 23.12.2019 р. № 483. Чинний від 01.01.2021. URL: http://online.budstandart.com/ua/catalog/doc-page.html?id_doc=88724 (date accessed: 28.07.2022).

With the help of the decelerograph VZM 300, experts in automotive engineering determined: the actual maximum deceleration ($j_{\max} = 8,98 \text{ m/s}^2$, on diagram: *decel. max*; E.g., Fig. 5) and the actual constant deceleration ($j_a = 8,15 \text{ m/s}^2$, on diagram: *decel. ISO*) of the Mercedes-Benz Sprinter.

Thus, on a dry and level asphalt surface, the permanent deceleration for Mercedes-Benz Sprinter, car equipped with ABS (according to the data of the decelerograph VZM 300) is 8.15 m/s^2 , which is significantly higher (from

7.7 to 17%) than the outdated data of methodical recommendations on forensic auto technical examination. That is why method-recommendations from forensic auto technical examination need immediate changes and additions, taking into account the diversification of the car park and the updating of the technical equipment of modern cars. In other cases, auto-technical experts are forced to carry out road tests of each individual car every time in case of appointment of a forensic examination based on the consequences of traffic collision.

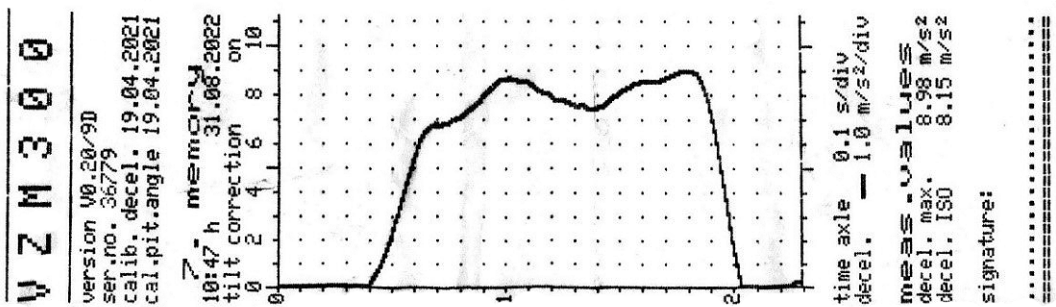


Fig. 5. Deselogram for determining the actual maximum and steady deceleration of the Mercedes-Benz Sprinter car

Conclusions

Progress creates more and more modern and perfect traffic safety systems. Operating with significant capabilities are able to adapt to any type of road surface and brake according to one of the effective algorithms by default. Statistics indicates that correctly adjusted ABS (provided that the rest of the car's systems are in good condition, regardless of the road surface) allows an average of 20% to reduce the braking distance,

leaving the driver to maneuver. Sometimes it is those few meters on which the life and health of passengers and pedestrians depend. Engineers have brought the design of ABS to a high level, currently refining only its individual components. Modern wheel sensors not only measure rotation speed: they also additionally integrate G-sensors and accelerometers. Improvement is also an increase in the functionality of the electronic unit (the same use of ABS as a basis for other systems).

It has been experimentally proven that the constant deceleration of an ABS equipped car on a dry and clean straight asphalt section of the road can significantly exceed the data recommended for use in forensic examination. At the same time, in icy conditions, the same value, on the contrary, is lower than the values specified in the relevant methodical recommendations. Unfortunately, outdated method recommendations for forensic auto technical examination need immediate changes and additions, taking into account the diversification of the car fleet and the updating of the technical equipment of modern cars. Otherwise, automotive experts are forced to carry out road tests of each individual car every time in the event of a forensic examination of the consequences of traffic collision.

Вплив антиблокувальної системи на керування автомобілем, принцип її дії в критичній ситуації

Богдан Чорний, Георгі Твалавадзе

Автори мали на меті визначити будову і принцип роботи, переваги і недоліки антиблокувальної системи, а також рівень безпеки автомобіля в разі її використання для застосування здобутих даних у судовій автотехнічній експертизі. До 70 % аварій припадають на випадки застосування водіями режиму екстреного гальмування, до 60 % — супроводжуються втратою стійкості й керованості. Гальмова система автівки має створювати на осях коліс гальмові моменти, які дають змогу в контрольований водієм спосіб зменшити швидкість руху, а також знерухомити автомобіль. У результаті тертя поверхонь елементів, що взаємодіють (одні пов'язані кінематикою з колесами, другі — з нерухомими елементами шасі), завдяки фрикційним гальмовим механізмам виникають гальмові моменти. Дис-

кові й барабанні гальма — найпоширеніші гальмові механізми сучасних автівок. Завдання антиблокувальної системи — зберегти керованість за екстреного гальмування. У кращому разі автомобіль ковзає прямо, у гіршому — неконтрольованою траєкторією з непередбачуваними наслідками. Новітня антиблокувальна система — це складна електронна конструкція гальмування, основа для інших систем: антибуксувальної, електронного контролю стійкості, допомоги в разі екстреного гальмування. Антиблокувальні системи нині встановлюють на легкові й вантажні автомобілі, мотоцикли, причепи, трактори, навіть на колісні шасі літаків. Автовиробники й автовласники гідно оцінили ефективність активної системи безпеки будь-якої пори року. Законодавчі органи різних країн спонукають автовиробників встановлювати антиблокувальні системи на всі автівки.

Ключові слова: антиблокувальна система; автомобіль; транспортний засіб; гальма; гальмування; дорожнє покриття; безпека дорожнього руху; судова автотехнічна експертиза.

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Declaration of Competing Interest

Authors declare no conflict of interest.

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Compliance Determination of Real Estate Objects with Requirements of Legal Regulations in Construction Field

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Issues arising while expert research to determine compliance of built real estate objects with requirements of legal regulations in the construction field are considered. Attention is focused on the need for experts to use the algorithm to solve similar issues in accordance with the methods developed by professionals of state specialized institutions. Definition of spontaneous and capital construction of immovable property is given. The methods of commissioning objects of spontaneous in compliance with requirements of legal regulations in the construction field have been studied and explained. The article purpose is to substantiate algorithm of actions for determining the compliance of built real estate objects with requirements of legal regulations to optimize forensic research.

Keywords: *ownership of immovable property; independent construction of immovable property; capital construction of immovable property; inspection of objects; commissioning; compliance determination of constructed objects with requirements of legal regulations; ownership recognition; forensic structural engineering.*

This article is translation of the original Ukrainian content, which source is available at the link: <https://khrife-journal.org/index.php/journal> (translated by Andriy Bublikov). The author acknowledges translation as corresponding to the original.

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Research Problem Formulation

One of the urgent tasks of forensic structural engineering is determining compliance of built real estate objects with requirements of legal regulations in the construction field.

Analysis of Essential Researches and Publications

Unfortunately, on tissue addressed in this article, there are no fundamental monographs or textbooks, at the same time, available research papers and researches of forensic experts.

Methodological principles and main aspects of the appointment of construction and technical expertise in recent years have been investigated, in particular: D. Puchko ¹; V. Kontymyrova and V. Mazurova ²;

L. Pugachova, L. Kyrylova and P. Kucherenko ³; N. Matsak, S. Kyrylenko and O. Posashkov ⁴; R. Rudzeych ⁵; Yu. Petryshyna, S. Radchenko and N. Syl'a ⁶.

Raised issue belongs to forensic expert tasks specified in the Scientific and Methodological Recommendations on the Preparation and Appointment of Forensic Examinations and Researches ⁷. For its solving professionals of state specialized expert institutions have developed methodical recommendations, which have been included in the Register of methods of conducting forensic examinations of the Ministry of Justice of Ukraine ⁸. In development of *Methodical recommendations for establishing the compliance of spontaneous buildings (structures) with the requirements of building standards and regulations* ⁹ employees of Hon. Prof. M. S. Bokarius Kharkiv Research

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- 6 Петришина Ю. Ю., Радченко С. В., Сила Н. В. Проблемні питання дослідження пандусів, призначених для доступу маломобільних груп населення до будівель, та визначення їх відповідності будівельним нормам і правилам. *Ibidem*. С. 406—415. DOI: 10.32353/khrife.2.2020.33 (date accessed: 24.05.2022).
- 7 Науково-методичні рекомендації з питань підготовки та призначення судових експертиз та експертних досліджень: затв. наказом Мін'юсту України від 08.10.1998 р. № 53/5 (зі змін. та допов.). URL: <https://zakon0.rada.gov.ua/laws/show/z0705-98> (date accessed: 24.05.2022).
- 8 Реєстр методик проведення судових експертиз. URL: <http://rmpse.minjust.gov.ua> (date accessed: 24.05.2022).
- 9 Методичні рекомендації із встановлення відповідності самочинно збудованих будівель (споруд) вимогам будівельних норм та правил: звіт НДР (заключ.). № держреєстр. 0108U000455 / ХНДІСЕ; Мін'юст України; кер. Л. Ф. Пугачова; викон. Р. Й. Кучеренко, Р. Б. Каплін, С. А. Кириленко та ін. Харків, 2009. 105 с.

Institute of Forensic Examinations (currently, National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute») participated and the methods of *Management of forensic structural inspections in civil cases* was prepared at Kyiv Scientific Research Institute of Forensic Expertise (authors: V. P. Malyk, V. H. Sanzharevskiy, O. I. Buratevych, H. I. Sanzharevska, O. B. Karpenko, O. S. Lysak, V. V. Apanasenko)¹⁰.

Article Purpose

Substantiate algorithm of actions for determining compliance of built objects of real estate with requirements of legal regulations to optimize forensic research.

Main Content Presentation

Currently spontaneous construction is one of the most urgent issues of capital construction in Ukraine. Solving issues related to spontaneous construction, its definition and legal consequences is urgent for improvement of legal regulation in capital construction and law enforcement practice.

The *construction of permanent facilities* term is given in para. 2.2 of the procedure for state financing of construction of permanent facilities: “*Construction of permanent facilities is the process of creating new, as well as expansion, reconstruction, technical re-equipment of existing enterprises, objects of industrial and non-industrial purpose, start-up complexes (taking into account design works, conducting bidding (tenders) in construction, conservation, deconservation of objects, maintenance of*

directorates of enterprises under construction, as well as acquisition of technological equipment, which is not included in the estimate of objects)”¹¹.

Achieving construction goal — putting the object into operation — is regulated by legal, construction-technical and other legislative norms.

Thus, according to Art. 39 of the Law of Ukraine: *On Regulation of City Planning Activity*:

“1. *Acceptance into operation of objects completed by construction, which according to the class of consequences (responsibility) belong to objects with minor consequences (CC1), and objects whose construction was carried out on the basis of a construction passport, is carried out by registration by relevant body of the state architectural and construction control on a free of charge basis of the declaration submitted by the customer about the facility’s readiness for operation within ten working days from the date of application registration.*

In case that after declaration registration on the construction start, name of the customer and/or general contractor, and/or the general designer, and/or the contractor has changed in connection with a change in the type of joint-stock company or in connection with the transformation of a joint-stock company into another economic company, in the declaration on the readiness of the object for operation, which is submitted for registration, the new (changed) name of the specified persons is indicated (if according to the declaration form they must be indicated) with the indication that the change of name took place in connection with by changing the type of joint-stock company or in connection with the transformation of a joint-stock company into another business company. If

10 Організація проведення судових будівельно-технічних експертиз по цивільних справах : звіт НДР (заключ.). Реєстр. код 10.6.02 / КНДІСЕ ; Мін’юст України. Київ, 2009. 39 с.

11 Порядок державного фінансування капітального будівництва : затв. Постановою КМУ від 27.12.2001 р. № 1764 (зі змін. та допов.). URL: <https://zakon.rada.gov.ua/laws/show/1764-2001-%D0%BF#Text> (date accessed: 24.05.2022).

there is such an indication in the declaration on the facility readiness for operation, the state architectural and construction control body does not have the right to return such a declaration due to the different names of the specified persons in the declaration on the start of construction work and in the declaration on the facility's readiness for operation.

<...>

2. Acceptance into operation of objects completed by construction, which according to the class of consequences (responsibility) belong to objects with medium (CC2) and significant (CC3) consequences, is carried out on the basis of an act of readiness of the object for exploitation by issuing a state architectural construction control certificate in accordance with the procedure determined by the Cabinet of Ministers of Ukraine.

<...>

In case that after declaration registration on the start construction, name of the customer and/or general contractor, and/or the general designer, and/or the contractor has changed in connection with a change in the type of joint-stock company or in connection with the transformation of a joint-stock company into another economic company, in the declaration on the readiness of the object for operation, which is submitted for registration, the new (changed) name of the specified persons is indicated (if according to the declaration form they must be indicated) with indication that change of name took place in connection with by changing the type of joint-stock company or in connection with transformation of a joint-stock company into another business company. If there is such an

indication in declaration on facility readiness for operation, the state architectural and construction control body does not have the right to return such a declaration due to the different names of the specified persons in the declaration on the start of construction work and in the declaration on the facility readiness for operation.

<...>

The act of readiness of the object for operation is signed by the customer, general designer, general contractor or contractor (in case the construction work is performed without the involvement of subcontractors), subcontractors, insurer (if the object is insured)"¹².

According to the Procedure for commissioning completed objects, the procedure for registering construction objects¹³ involves entering information into a single register of documents giving the right to perform preparatory and construction works and certifying the commissioning of completed objects.

According to *Civil Code of Ukraine*:

"1. Residential building, building, structure, other immovable property is considered as spontaneous construction if it is built or is being built on a plot of land that was not set aside for this purpose, or without an appropriate document that gives the right to carry out construction work or a duly approved project or with significant violations of construction norms and rules.

<...>

2. Person who has carried out or is carrying out independent construction of immovable property does not acquire the right to own it"¹⁴.

12 Про регулювання містобудівної діяльності : Закон України від 17.02.2011 р. № 3038-VI (зі змін та допов.). URL: <https://zakon.rada.gov.ua/laws/show/3038-17#Text> (date accessed: 24.05.2022).

13 Порядок прийняття в експлуатацію закінчених будівництвом об'єктів : затв. Постановою КМУ від 13.04.2011 р. № 461 (у ред. Постанови КМУ від 08.09.2015 р. № 750; зі змін та допов.). URL: <https://zakon.rada.gov.ua/laws/show/461-2011-%D0%BF#Text> (date accessed: 24.05.2022).

14 Цивільний кодекс України від 16.01.2003 р. № 435-IV (зі змін та допов.). URL: <https://zakon.rada.gov.ua/laws/show/435-15#Text> (date accessed: 24.05.2022).

Thus, the grounds for determining a real estate object as an object of independent construction are its construction:

- on a plot of land that was not properly provided for development;
- without an appropriate permit or a project approved according to the rules;
- with significant violations of construction norms and rules.

It should be noted that the current legislation of Ukraine does not contain a single concept of *construction*, at the same time, this concept is quite meaningful. However, in order to recognize the construction as spontaneous, it must be related to the real estate object and violate one of the provisions of Art. 376 of the Civil Code of Ukraine ¹⁵.

Ownership of spontaneous constructed immovable property by a court decision is recognized by a person who has spontaneous on a plot of land that was not granted to him for this purpose, provided that the plot of land is given to a person under the already constructed immovable property in accordance with the law to the requirements of state building regulations.

According to the Law of Ukraine: *On Regulation of City Planning Activity* ¹⁶ urban planning disputes are resolved by local councils within the limits of their powers, as well as by the court on the basis of current legislation.

Currently, there are, among other things, the following possibilities for taking spontaneous buildings into operation in an administrative manner:

- commissioning of buildings built before 05.08.1992
- commissioning of buildings built between 08/05/1992 and 04/09/2015 ¹⁷.

Such opportunities apply only to individual residential, garden and country houses with an area of up to 300 m².

Buildings built before 05.08.1992 are put into operation based on the following provisions.

On August 5, 1992, Resolution No. 449 of the Cabinet of Ministers of Ukraine (hereinafter referred to as CabMin Resolution) No. 449 defined the procedure and conditions for the commissioning of construction facilities for the first time at the legislative level the Regulation on the procedure for commissioning completed state-ordered facilities was approved ¹⁸. In other words, until August 5, 1992, procedure for putting individual houses into operation in the case of registration of ownership did not exist, as explained by the Inspection of the state architectural and construction control in the letter No. 40-12-2409, *Regarding the commissioning of facilities, completed by August 5, 1992* dated on 01.09.2011 ¹⁹.

15 Цивільний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/435-15#Text> (date accessed: 24.05.2022).

16 Про регулювання містобудівної діяльності URL: <https://zakon.rada.gov.ua/laws/show/3038-17#Text> (date accessed: 24.05.2022).

17 Ibidem.

18 Положення про порядок прийняття в експлуатацію закінчених будівництвом об'єктів державного замовлення : затв. Постановою КМУ від 05.08.1992 р. № 449 (утрат. чин.). URL: <https://zakon.rada.gov.ua/laws/show/449-92-%D0%BF#Text> (date accessed: 24.05.2022). Наразі діє згаданий вище Порядок прийняття в експлуатацію закінчених будівництвом об'єктів URL: <https://zakon.rada.gov.ua/laws/show/461-2011-%D0%BF#Text> (date accessed: 24.05.2022).

19 Щодо прийняття в експлуатацію об'єктів, закінчених будівництвом до 5 серпня 1992 року : лист Держархбудінспекції України від 01.09.2011 р. № 40-12-2409. URL: <https://zakon.rada.gov.ua/rada/show/v2409816-11#Text> (date accessed: 24.05.2022).

The peculiarity of acceptance into operation of spontaneous buildings, erected before 05.08.1992, for such an object, it is not necessary to register a declaration about the readiness of the object for operation in the bodies of the State Architectural and Building Control.

Ownership rights to a spontaneous building are registered by the state registrar on the basis of the following documents (list is approximate):

- applications for registration;
- technical certificate residential premises;
- certificate of address assignment;
- legal documents for the land plot.

Buildings built in the period from 05.08.1992 to 09.04.2015 are put into operation according to the regulatory documents specified below.

In the Law of Ukraine *on Regulation of City Planning Activity*, the legislator provided for the commissioning of buildings built between 08/05/1992 and 04/09/2015, replacing in the spring of 2018, para. 1–5 p. 9 Ch. V of this Law with three new paragraphs — in accordance with the Law of Ukraine ²⁰On Amendments to Clause 9 of Chapter V: *Final Provisions of the Law of Ukraine: On Regulation of City Planning Activity* regarding the extension of the term of acceptance into operation of construction objects built without a construction permit ²¹, namely:

“The body of the state architectural and construction control is free of charge within 10 working days from the date of submission of the application by the owners (users) of the land plots on which construction objects are located according to the class of consequences (responsibility) belong to objects with minor consequences (CC1), built on a plot of land for the appropriate purpose without a permit document for the performance of construction works, based on the results of a technical survey, accepts into operation:

- *built in the period from August 5, 1992 to April 9, 2015, individual (homestead) residential houses, garden, country houses with a total area of up to 300 square meters, as well as household (homestead) buildings and structures with a total area of up to 300 square meters;*
- *agricultural buildings and structures built before March 12, 2011”* ²².

On August 31, 2018, the Procedure for carrying out a technical inspection and acceptance into operation of individual (homestead) residential buildings, garden, country houses, household (homestead) buildings and structures, buildings and structures of agricultural purpose, which by the class of consequences (responsibility) belong to objects with minor consequences (SS1), built on a plot of land of the appropriate purpose without a permit document for the performance of construction works ²³.

20 Про регулювання містобудівної діяльності URL: <https://zakon.rada.gov.ua/laws/show/3038-17#Text> (date accessed: 24.05.2022).

21 Про внесення зміни до пункту 9 розділу V «Прикінцеві положення» Закону України «Про регулювання містобудівної діяльності» щодо продовження терміну прийняття в експлуатацію об'єктів будівництва, збудованих без дозволу на виконання будівельних робіт : Закон України від 22.03.2018 р. № 2363-VIII. URL: <https://zakon.rada.gov.ua/laws/show/2363-19#Text> (date accessed: 24.05.2022).

22 Про регулювання містобудівної діяльності URL: <https://zakon.rada.gov.ua/laws/show/3038-17/ed20220914#Text> (date accessed: 14.09.2022).

23 Порядок проведення технічного обстеження і прийняття в експлуатацію індивідуальних (садибних) житлових будинків, садових, дачних будинків, господарських (присадибних) будівель і споруд, будівель і споруд сільськогосподарського призначення, що за класом

In order to take into operation, the buildings built in the period 1992-2015, it is prescribed to register the declaration of readiness of the object for operation in the bodies of the State Government Control at the following stages:

- carrying out a technical inspection and drawing up technical certificate residential premises;
- receiving a registered declaration on the facility readiness for operation;
- registration of ownership of a house in the State Register of Real Property Rights.

Professionals carry out technical inspection of objects in accordance with the above-mentioned Procedure and construction norms, standards, regulatory documents and rules approved by law.

The technical examination includes the following stages:

- preliminary (visual) inspection of the object, in particular inspection and photography of the object and its structural elements, measurement, determination of the class of consequences (responsibility) of the object, analysis of project and other technical documentation (if available). The results of photofixation are subject to entry by the executor into the Register of construction activities of the Unified State Electronic System in the field of construction.
- detailed (instrumental) inspection of the object, in particular,

determination of parameters and characteristics of materials, products and structures (if necessary, with the involvement of specialists of the relevant area of specialization and certified laboratories).

On the basis of the information received during technical inspection, taking into account the type, complexity, technical and other features of the object, as well as data from technical certificate residential premises, project and other technical documentation for the object (if available), performer (business entity, technical inventory expert (engineer) evaluates technical object condition.

Based on assessment results (using Register of construction activities), the contractor creates a report in the form of an electronic document on the technical inspection of individual (manor) residential buildings, garden and country houses, household (manor) buildings and structures, agricultural buildings and structures, according to the class consequences (responsibility) belong to objects with minor consequences (SS1), for their commissioning and signs it by applying a qualified electronic signature.

When creating a report in the Register of construction activities, the contractor uses a selection of complex types of information provided for by the Procedure for maintaining the Unified State Electronic System in the field of construction (hereinafter referred to as Procedure for maintaining the Unified State Electronic System in the field of construction ²⁴) and

наслідків (відповідальності) належать до об'єктів з незначними наслідками (CC1), збудовані на земельній ділянці відповідного цільового призначення без дозвільного документа на виконання будівельних робіт : наказ Мінрегіону України від 03.07.2018 р. № 158 (зі змін та допов.). URL: <https://zakon.rada.gov.ua/laws/show/z0976-18#Text> (date accessed: 24.05.2022).

24 Порядок ведення Єдиної державної електронної системи у сфері будівництва : затв. Постановою КМУ від 23.06.2021 р. № 681 (зі змін та допов.). URL: <https://zakon.rada.gov.ua/laws/show/681-2021-%D0%BF/ed20220916#Text> (date accessed: 14.09.2022).

puts a mark on the location of the object on a cartographic basis.

The report is considered to have been created from the moment of its approval by the business entity that conducted the technical inspection by imposing a qualified authorized person electronic signature such business entity.

Technical inspection of individual (manor) residential buildings, garden and country houses with a total area of up to 300 square meters. m inclusive, as well as household (homestead) buildings and structures with a total area of up to 100 m² inclusive should be carried out by the performer (technical inventory expert (engineer)) during their technical inventory based on the results of the previous (visual) survey stage.

According to the results of the preliminary (visual) stage of the survey, the contractor enters into the Register of construction activities information about the possibility of reliable and safe operation of individual (manor) residential buildings, garden and country houses with a total area of up to 300 square meters. m and household (homestead) buildings and structures with a total area of up to 100 m².

State Construction and Building Control takes the object into operation within 10 working days from the date of submission of the relevant application by the owners (users) of the land plots on which such objects are located, based on the results of the technical inspection of these objects by registering the declaration of object readiness submitted by them before operation.

The customer (authorized person) submits an application in the form of a completed declaration in the form given in the appendix to the Procedure for conducting Unified State Electronic System in the field of construction, as well as:

- copy of the document certifying the right of ownership or use of the land plot of the appropriate purpose on which the object is located;
- a copy of technical certificate residential premises drawn up before 01.12.2021, information about which is already available in the Register of construction activities.

Technical certificate residential premises, drawn up before the entry into force of the Procedure for Management of Unified State Electronic System in the field of construction, for individual (manor) residential houses, garden houses, country houses with a total area of up to 300 m² including household (homestead) buildings and structures with a total area of up to 100 m² inclusive should be submitted provided there is information about the possibility or impossibility of reliable and safe operation of individual (manor) residential buildings, garden houses, country houses with a total area of up to 300 m² and household (homestead) buildings and structures with a total area of up to 100 m² in the Register of construction activities.

The declaration should be signed by the co-owners of the land plot and/or the specified object (if they are available).

State Architectural and Building Control verifies the completeness of the data specified in the declaration and ensures that information contained in the declaration is entered into Register of construction activities.

Data specified in the declaration should be consistent with the documents that applicant submits along with. The customer is responsible for completeness and reliability of the data specified in the declaration submitted by him, in accordance with current legislation requirements.

State Architectural and Building Control returns to the customer the declaration and the submitted documents for revision with justification of reasons for the return and recommendations for their elimination within the period provided for its registration (if the declaration was submitted or executed in violation of the requirements established by the Procedure for Conducting the Unified State Electronic System in the field of construction, in particular, in the case of detection of non-compliance of the submitted documents with the requirements of the law, inaccurate information in submitted documents). At the same time, a copy of the declaration is kept in the State Architectural and Building Control Authority.

The decision on the declaration returns and submitted documents is made using the Register of construction activities in the form of an electronic document with the registration number and signed by an official of the State Architectural and Building Control Authority by imposing a qualified electronic signature.

After eliminating the deficiencies that became the basis for the decision to return the declaration for revision, the customer has the right to re-apply to the State Architectural and Building Control Authority for registration of the declaration in accordance with the Procedure for maintaining Unified State Electronic System in the field of construction.

The second declaration return and submitted documents to the customer by the State Architectural and Building Control Authority for the same reasons is not allowed, except in cases of failure by the customer to eliminate errors that he made earlier.

The date of commissioning of the object is the date of declaration registration of readiness of the operation object.

The registered declaration is the basis for entering into contracts for the supply of resources necessary for its operation: water, gas, heat, electricity to the commissioned object, entering data about such an object into the state statistical reporting and registering its ownership.

If there are title documents for the object being put into operation, the registered declaration is the basis for making changes to the object technical certificate residential premises.

After carrying out a technical inspection and drawing up a technical passport, the following documents should be submitted to the local authorities of the State Architectural and Building Control:

- declaration on the facility readiness for operation;
- technical certificate residential premises for the house with a mark on the technical survey placed on the schematic plan of the land plot;
- title document for the land plot (state act, contract, certificate).

Ownership of the house is registered by the state registrar after carrying out a technical inspection and receiving a registered declaration subject to provision following documents are provided:

- applications for registration;
- declaration on the facility readiness for operation, registered by the State Construction Control Authority and entered in the Unified Register of Documents granting the right to perform preparatory and construction works and certify the commissioning of completed facilities;
- technical certificate residential premises;
- written statement or agreement between co-owners on the distribution of shares in common

property (if there are two or more co-owners).

The registrar examination result of documents on the registration of ownership rights to the house is an extract from the State Register of real property rights to immovable property, which confirming registration of ownership right to the house.

Application of given sequence of so-called construction amnesty both for buildings erected before 1992 and for those erected during 1992-2015 is not limited by the validity period.

According to Part 5 of Art. 376 of the Civil Code of Ukraine: *“at the request of the owner (user) of the land plot, the court may recognize the right of ownership of the immovable property that was automatically built on it, if this does not violate the rights of other persons”*²⁵. The above requirements apply to completed spontaneous objects erected on land plots owned or used by the applicant. In addition, the land plot should be allocated for use specifically for construction.

The decision to recognize ownership is made by the court. The procedure can take time, and the result will depend on the evidence provided by the applicant (in particular, on the attachment of a certificate from the local department of architecture, fire service, regional sanitary and epidemiological service): in this case, the court may recognize not only the ownership of the spontaneous built object, but its compliance with requirements of

legal regulations. Under such conditions, there is no need to put the construction object into operation.

In addition, the decision of the Supreme Court of Ukraine No. 306/2140/17 (as part of the panel of judges of the Second Judicial Chamber of the Civil Court of Cassation) in case dated on 18.04.2019 explained:

“The rules of Article 376 of the Civil Code of Ukraine cannot be applied while deciding cases based on claims:

- *on the recognition of the right of ownership of spontaneously converted apartments in multi-apartment buildings of various housing funds, since such legal relations are regulated by other legal norms, in particular, Article 383 of the Civil Code and relevant norms of the Housing Code of Ukraine*²⁶ *regarding apartment owners;*
- *on recognition of the right of ownership of spontaneous temporary structures;*
- *on recognition of the right of ownership of spontaneous accessories to the main thing (porch, veranda, attic, etc.)”*²⁷.

It should be noted that in order to recognize the construction as self-executing, one of the grounds provided for in Part 1 of Art. 376 of the Civil Code of Ukraine²⁸, construction will be considered spontaneous despite the fact that it is carried out by an individual on his own or outsider land plot, however (taking into account Part 3—7 of Art. 376 of the Civil Code of Ukraine²⁹), various consequences

25 Цивільний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/435-15#Text> (date accessed: 24.05.2022).

26 Житловий кодекс України від 30.06.1983 р. № 5464-X (зі змін, та допов.). URL: <https://zakon.rada.gov.ua/laws/show/5464-10#Text> (date accessed: 24.05.2022).— Прим. авт.

27 Постанова КЦС ВС України від 18.04.2019 р. (справа № 306/2140/17, провадж. № 61-47454св18). URL: <http://iplex.com.ua/doc.php?regnum=81288352&red=1000039945eb2832131bc83bb5442b290c3cb9&d=5> (date accessed: 24.05.2022).

28 Цивільний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/435-15#Text> (date accessed: 24.05.2022).

29 Ibidem.

of such self-executing construction are possible.

According to Part 3 of Art. 376 of the Civil Code of Ukraine³⁰: *“right of ownership of spontaneous immovable property may, by a court decision, be recognized by a person who self-constructed on a plot of land that was not allocated to him for this purpose, on the condition that the plot of land be provided in accordance with the established procedure to a person under the already constructed immovable property”*.

If the owner (user) of the land plot objects to the ownership recognition real estate for the person carried out the spontaneous construction on its land plot, or if this violates the rights of others, the property is subject to demolition by the person who carried out the self-employed construction, or at his expense (Part 4 of Art. 376 of the Civil Code of Ukraine³¹).

Consequently, a person who has carried out the independent construction of an object on a land plot that was not allocated to him for this purpose, without the consent of another owner (user) of the land plot, cannot acquire ownership of it in accordance with Art. 331 of the Civil Code of Ukraine³². Such an object should be demolished or transferred to the owner (user) of the land plot on which this object is built in accordance with Art. 376 of the Civil Code of Ukraine³³.

Violations of the design or building regulations, even if the developer has all the permits and approvals can be recognized as the consequences of spontaneous construction. In this case, it is under no circumstances possible to transfer

ownership rights to the owner (user) of the land plot, since (taking into account Part 5 of Art. 376 of the Civil Code of Ukraine³⁴) this will violate the rights of the developer.

Every person has the right to the protection of his civil right only in case of its violation, non-recognition or dispute (Part 1 of Article 15 of the Civil Code of Ukraine³⁵).

It is appropriate to apply to the court with a claim for spontaneous in availability of data that issue raised was the subject of consideration by the relevant competent state body, which decisions or it lack indicate the existence of a dispute about the right.

If the plaintiff did not apply to the competent state body with an application for acceptance of the object for operation, the court resolves the dispute on the merits, taking into account the given circumstances and legal requirements.

Practical resolution of the issue of compliance of the building object (or individual elements of real estate objects) with the design and technical documentation and the requirements of normative legal acts in the field of construction (Building code, building regulations, standards, technical conditions, etc.) while forensic structural inspection (research) consists in the application of a certain algorithm by forensic expert.

After receiving the decision (application) on forensic examination (research) and studying provided materials (in particular, in response to the petition) (in particular, information about the land plot, technical documentation for the

30 Цивільний кодекс України URL: <https://zakon.rada.gov.ua/laws/show/435-15#Text> (date accessed: 24.05.2022).

31 Ibidem.

32 Ibidem.

33 Ibidem.

34 Ibidem.

35 Ibidem.

object), forensic expert directly conducts an object inspection. (Note that concept of *legal norms in the field of construction* is rather ambiguous, since construction standards regulate a significant range of construction issues.) Conducting this species of forensic examination involves the use by the expert of the following methods of research: examination (visual inspection), instrumental measurements, description, fixation, comparison, comparison, design, photographing, etc.

Within the framework of forensic structural inspection (research), forensic expert measures and records the results according to the following parameters: planning parameters of premises and buildings, their compliance with the actual use, natural lighting and evacuation exits, placement of engineering systems in the building, fire and sanitary distances between the buildings under research and to buildings and structures located on adjacent land plots.

Forensic expert records the results of the examination (inspection), performing sketches and diagrams, photographing and describing: in this way, the expert fixes the signs, properties, type, size of the objects under research allowing to make an opinion about in general, or about individual details of these objects.

It is necessary to compare the results of the review with the text documentation (Property Registration Bureau technical certificate residential premises, project, etc.). If while the matching (by arithmetic verification or graphic overlay) of the results of the on-site inspection with the data of Property Registration Bureau technical certificate residential premises (project, etc.) there is a discrepancy in the areas, heights, internal and external dimensions of the premises, etc., forensic expert should inform the court, file a petition for the need to change the passport data and provide the

changed technical certificate residential premises (as additional materials for conducting a forensic examination).

Conclusions

Application of a full algorithm of actions (comprehensive study of initial data and the results of the field survey, analysis and comparison of obtained data with the requirements of regulatory legal acts) allows the expert to provide a clear, impartial conclusion on the determination of the compliance of the built objects of real estate with the requirements of regulatory legal acts in the field of construction.

The above information will be useful while conducting forensic structural inspection on the issues of determining compliance of constructed real estate with requirements of legal regulations in the construction field.

Визначення відповідності об'єктів нерухомого майна вимогам нормативно-правових актів у галузі будівництва

**Сергій Науменко, Вікторія Симоненко,
Тарас Таранець**

Розглянуто проблемні питання, що виникають під час проведення експертних досліджень із визначення відповідності побудованих об'єктів нерухомого майна вимогам нормативно-правових актів у галузі будівництва. Акцентовано увагу на необхідності застосування експертами алгоритму для розв'язання подібних питань згідно з методиками, розробленими фахівцями державних спеціалізованих установ. Наведено визначення самочинного та капітального будівництва нерухомого майна. Досліджено й викладено способи прийняття об'єктів самочинного будівництва в експлуатацію із дотриманням вимог нормативно-правових актів у галузі будівництва. Метою

статті є обґрунтування алгоритму дій із визначення відповідності побудованих об'єктів нерухомого майна вимогам нормативно-правових актів для оптимізації процесу експертного дослідження.

Ключові слова: право власності на нерухоме майно; самочинне будівництво нерухомого майна; капітальне будівництво нерухомого майна; обстеження об'єктів; прийняття в експлуатацію; визначення відповідності побудованих об'єктів вимогам нормативно-правових актів; визнання права власності; будівельно-технічна експертиза.

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Declaration of Competing Interest

Authors declare no conflict of interest.

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International Congress of Criminalists: *Criminalistics and Forensic Expertology: Science, Studies, Practice*

On September 8-10, 2022, the capital of the Republic of Lithuania, Vilnius, hosted the *Criminalistics and Forensic Expertology: Science, Studies, Practice* International Congress of Criminalists that brought together well-known scientists from many countries of Europe. The event was organized by the Mykolas Romeris University, Forensic Science Centre of Lithuania and the Criminalists' Association of Lithuania in offline mode with the opportunity to participate in the online format.

Welcome words at the event opening of on September 8, 2022 were addressed to organizers and participants by: **Inga Žalėnienė** Professor, Doctor of Law; Rector of the University Mykolas Romeris; **Giedrius Mozuraitis**, Director of the Center for Forensic Science Centre of Lithuania; **Valery Shepitko**, Doctor of Law, Professor, Honored Worker of Science and Technology, Academician of the National Academy of Legal Sciences of Ukraine and others.

The event was moderated by **Snieguolė Matulienė**, Doctor of Law Professor of University of Mykolas Romeris; Gabrielė **Juodkaitė-Granskienė**, Associate Professor at the University of Vilnius, Doctor of Law and **Henryk Malewski**, Professor at the University of Mykolas Romeris, Doctor of Law.

As a result of the work of the Congress, a collection of materials dedicated to the anniversary of Professor **Vidmantas Egidijus Kurapka** was published, the reviewers of which were **Ella Simakova-Yefremian**, Deputy Director for Academic Affairs of NSC «Hon. Prof. M. S. Bokarius FSI», Doctor of Law, Professor, and Giedrius Mozuraitis, Director of Forensic Science Centre of Lithuania, Doctor in Law.

Participants considered ways of solving topical issues in the field of criminalistics and forensic science, in particular: use of artificial intelligence, weapons research, significance of the crime scene and the principles of



its review, issues of teaching criminalistics in post-Soviet countries, etc.

At plenary presentation, the report: *On the main concepts of criminalistics policy – the harmonizations vector*” was presented by **Vidmantas Egidijus Kurapka**, Doctor of Law, Professor, co-authored with **Žaneta Navickienė** Professor, Doctor of **Law and Ilona Tamelė** (Lithuania).

Due to the Russian aggression in Ukraine, the report: *Nuclear forensics: formation and role in modern conditions*, prepared by **Valery Shepitko**, Doctor of Law, Professor, Honored Worker of Science and Technology, Academician of the National Academy of Legal Sciences of Ukraine and **Mykhailo Shepitko** Doctor of Law, Professor (Ukraine), was extremely relevant.

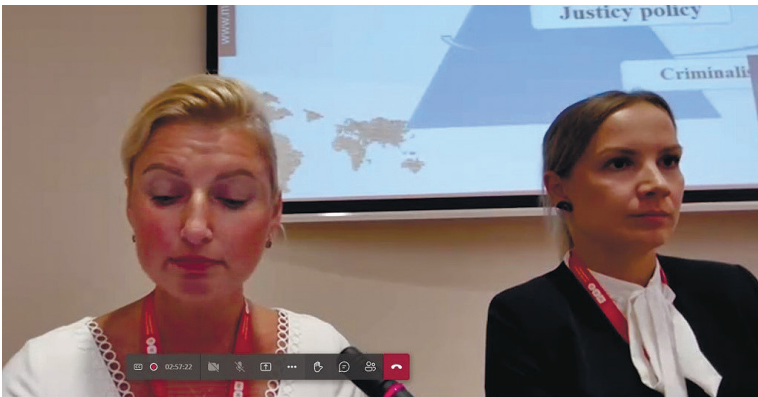
The report: *Application of artificial intelligence in forensic science* was presented by Professor Emeritus of the University of Warsaw, **Piotr Girdwoyń**, Doctor of Law that he prepared with his colleague, **Tadeusz Tomaszewski**, Professor Emeritus of the University of Warsaw, Doctor of Law.

The participants’ attention was attracted by the report: *Significance of the crime scene and specific principles of inspection* by scientists from the Czech Republic – **Jozef Meteňko**, Professor, Doctor of Law of the Police Academy of Bratislava and **Miriam Meteňková**.

This day, the following speakers came out: Dr. **Silke Brodbeck** (Germany) on the topic: *Computer support in the forensic science – a critical approach*”, Dr. **Bakhtiyar Aliyev** and **Nazraddin Ahmadzadada** (Azerbaijan) on the topic: *International legal analysis of maritime robbery and comprehensive measures to combat it* and Prof. Dr. **Gia Dekanozishvili** (Georgia) on the topic: *Problems of teaching criminalistics in post-soviet countries and ways to solve them*.

The next day, plenary session was opened by **Iryna Shepitko** (Ukraine) with a report: *Forensic activity and expert provision of*

justice in Ukraine: international experience and European integration processes. On this day, the participants devoted their speeches to the following topics: *Criminal procedure in absentia: problems arising from newest court practices* (Professor **Raimundas Jurka** and **Vytautas Sirvydis**;



Lithuania), *Scientific-practical competence of the forensic expert performing deontological examination* (**Laura Šivickaitė-Moldarienė** and Doctor of Law **Gabrielė Juodkaitė-Granskienė**; Lithuania); *Polygraph usage in criminalistic practice* (Professor **Marek Fryšták** and **David Textl**; Czech Republic) and others.

In total, the program of the event announced more than 30 reports, each of which was heard and discussed by the participants. Thanks to opportunity to participate online, many interested scientists from different countries of Europe participated in the Congress.

Employees of NSC «Hon. Prof. M. S. Bokarius FSI» enriched their forensic arsenal with interesting and relevant content presented in the speeches of the speakers of the event. The International Congress of Criminalists united forensic experts for development of forensic expert activity, exchange of experience and knowledge which is especially relevant in the context of full-scale Russian aggression against Ukraine.

*Information was prepared by **Kateryna Sylenok**,
Researcher of NSC «Hon. Prof. M. S. Bokarius FSI»*



All-Ukrainian Scientific and Practical Conference: *Actual Issues of Forensic Science Activity in Conditions of Martial Law and the Post-War Period*

On September 28, 2022, the All-Ukrainian Scientific and Practical Conference: *Actual Issues of Forensic Science Activity in Conditions of Martial Law and the Post-War Period* was held online. The event was organized by the Odessa Research Institute of Forensic Science of the Ministry of Justice of Ukraine and the Lviv Research Forensic Center of the Ministry of Internal Affairs of Ukraine.

The conference was moderated by **Antonina Cheremnova**, Academic Secretary of Odessa Research Institute of Forensic Science, PhD in Law, Associate Professor and **Mykola Bednarchuk** Head of the Monitoring and Information Support Sector of the Lviv SRFC, PhD in Technology, Professor.

The event participants were addressed by **Dmytro Kishko** Director of Odessa Research Institute of Forensic Science; **Roman Zaiats** Director of Lviv SRFC Doctor of Law, Professor, Honored Lawyer of Ukraine, Academician of the Ukrainian Academy of Sciences. Deputy Minister of Justice of Ukraine, Doctor of Philosophy in Law **Andrii Haichenko** in his welcoming speech noted the importance of such measures to increase the effectiveness of forensic expert activity and outlined the main tasks that forensic experts faced during the war and which will need to be solved during the post-war recovery of Ukraine.

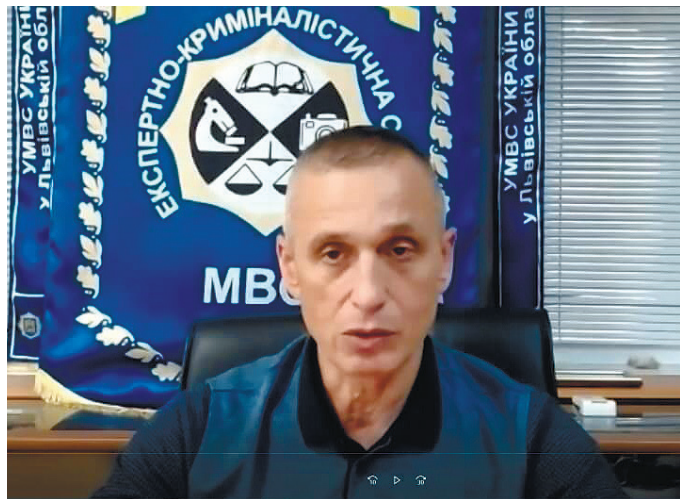
Ella Simakova-Yefremian, Deputy Director for Academic Affairs, Doctor of Law, Professor, Honored Worker of Science and Technology of Ukraine of NSC «Hon. Prof. M. S. Bokarius FSI» in her opening speech from the management and staff of the Center focused on the priority areas of



expert support of justice on the subject of the conference (molecular genetic research aimed at identifying the dead bodies; evaluation and construction research to calculate the losses suffered by individuals and legal entities as a result of artillery shelling, missile strikes and bombing, etc.). Heads of specialized expert institutions of the Ministry of Justice, the Ministry of Internal Affairs and the Security Service of Ukraine and higher education institutions also made speeches at the opening of the conference.

The conference topic raised various and urgent issues of development of forensic science and practice in the conditions of martial law. Speakers presented their own vision of possible ways to solve pressing issues. **Valery Tishchenko**, Head of the Department of Forensics of the National University “Odesa Law Academy”, Doctor of Law, professor, corresponding member of the National Academy of Legal Sciences of Ukraine, gave a speech *Forensics during period of martial law in Ukraine*, where he highlighted the general provisions of this field of knowledge. The speech of **Alla Lysenko**, First deputy director of Dnipro Forensic Science Institute of the Ministry of Justice of Ukraine was about *Determining the amount of losses caused to economic entities as a result of the armed aggression of the Russian Federation, while forensic economic examinations*. Candidate of Pedagogical Sciences, Associate Professor, Deputy Director of Separate structural subdivision “Lviv Applied College of Fashion Industry of Kyiv National University of Technologies and Design” **Oksana Khodan** spoke on the topic: *Expert evaluation of modern content for material support of the Armed Forces*.

Oleksandr Vdovichenko, Deputy Head of the Department of Explosive and Fire Technical Research of the Kharkiv SRFC of the Ministry of Internal Affairs of Ukraine, presented the report: *Some features of detection and fixation of traces of an explosion from jet and missile weapons*. **Marharyta Zhuravlyova**, Deputy Director, Responsible for Forensic Examinations, of the Odesa Forensic Science Institute of the Ministry



of Justice of Ukraine, doctor of philosophy in the field of psychology, discussed the topic: *Psychological study of images containing propaganda signs of the Russian Nazi totalitarian regime, armed aggression of the Russian Federation as a terrorist state against Ukraine*; **Olesya Vashchuk**, Professor of the Department of Forensics of the National University “Odesa Law Academy”, Doctor of Law, Professor devoted her report to *Researching the peculiarities of non-verbal behavior in video recordings*. The Department Head speech of biological research and accounting of the Lviv SRFC of the Ministry of Internal Affairs of Ukraine, **Maria Yakymiv**, was about *Possibility of an automatic system of forensic accounting of human genetic features in Ukraine during the genetic identification of unrecognizable human bodies in the conditions of a military invasion*; **Olena Samoilenko**, Principal Researcher of the department for researching the problems of countering cybercrimes and threats to information security of the Interdepartmental Research Center for Combating Organized Crime at the National Security and Defense Council of Ukraine of Ukraine, Professor of the Department of Forensic Sciences of the National University “Odesa Law Academy”, **Olena Samoilenko**, Doctor of Law, Professor presented the report: *Issues of using of special knowledge in the process of counteracting the illegal activities of organized criminal groups in the field of circulation of excise good*.

In total, 119 participants joined the work of the scientific and practical conference. Since the event took place in the format of both personal participation of participants and with the help of the ZOOM platform, all interested parties were able to participate in discussion.

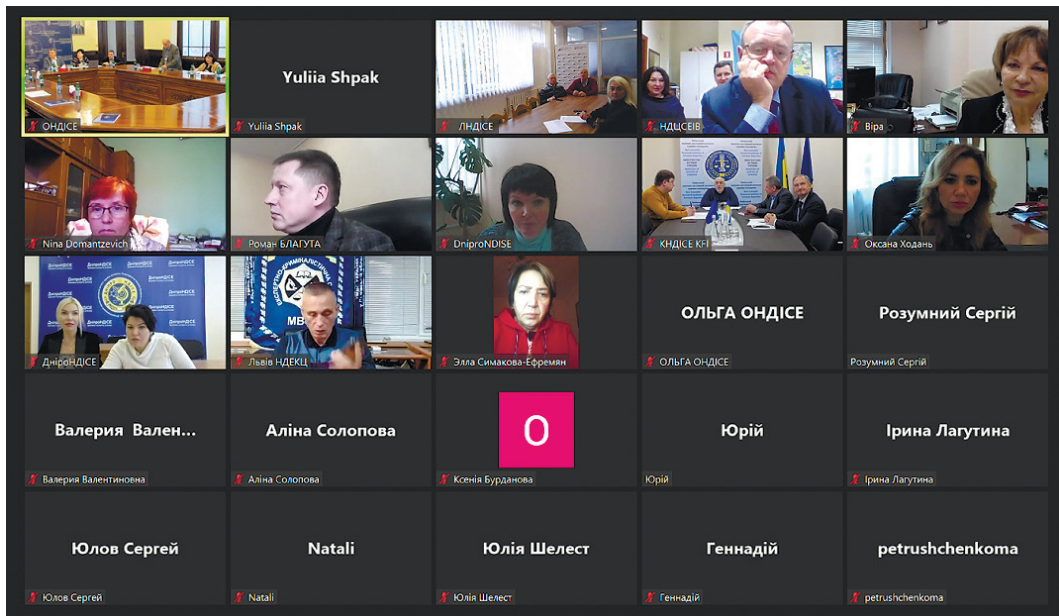
The collection of abstracts of the conference published the reports of such employees of NSC «Hon. Prof. M. S. Bokarius FSI»: Deputy Director for Forensic Examinations, PhD in Law, Senior Researcher, Honored Lawyer of Ukraine **Ihor Bohdaniuk**; Leading Forensic Expert **Oleksandr Naglov**; Senior Researchers **Serhii Rogalin** and **Ihor Shebalkov**; Department Head **Volodymyr Chuprun**; Postgraduate Student **Yevhen Pivnyov**; Forensic Experts **Oleksandr Guriev**, **Viktor Ustymenko**, **Kostiantyn Chernihivskyi** and **Maxim Shypilov**; Researchers **Viktor Chernyuk**, **Kateryna Sylenok** and **Denis Chekin**.

Participants of the conference had opportunity to exchange scientific and practical developments in the field of conducting various types of research and to discuss problematic issues.

Management and staff of NSC «Hon. Prof. M. S. Bokarius FSI» are grateful to the Odessa Forensic Science Institute and the Lviv SRFC for the high level of organization of the event and the opportunity to participate in the conference and highly appreciate such events that bring together expert community in such a difficult time for our country.

Together we will win! Glory to Ukraine!

*Information was prepared by **Anton Polianskyi**,
Doctor of Law, Docent, Head of Department
at NSC «Hon. Prof. M. S. Bokarius FSI»*



International Round Table “Development of Ecological Judicial Expertise – An Essential Objective in Environmental Protection”

National center of judicial expertise under the Ministry of Justice of the Republic of Moldova (together with *Babeş-Bolyai* University (Cluj-Napoca, Romania), University of professional training of Wroclaw, (Wroclaw, Poland), Kirovohrad SRFC, National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute», Chemistry institute of the republic of Moldova, Faculty of Chemistry and Chemical Technologies of the State University of the Republic of Moldova, Department of Biology and Chemistry of the State University of Tiraspol) organized the International Round Table: *Development of Ecological Judicial Expertise – An Essential Objective in Environmental Protection*. The event was moderated by **Ion Lopatenco** Head of the Laboratory for Analysis and Planning of the National Center for Forensic Examinations under the Ministry of Justice of the Republic of Moldova.

The conference participants covered not only experts in the field of forensic examination of the Republic of Moldova, but also representatives of other countries of the world: Sweden, Romania, Poland, Armenia, Ukraine, etc. Director of the National Center for Forensic Examinations, Doctor of Philosophy in Law **Olga Kataraga** in her opening speech focused on the need to support Ukrainians in the difficult conditions of war, in particular, forensic experts.

Speakers addressed the issue of environmental pollution, outlining the factors that adversely affect nature and ways to prevent such impacts. The conference brought together scientists from many countries of Europe, who exchanged experiences within the discussion.

Irena Malinowska, Rector's Plenipotentiary for International-



ization Vocational Training College in Wrocław, gave a speech *Legal and organizational instruments for counteracting illegal waste management*"; **Antonina Cheremnova**, PhD in Law, Associate professor, Academic Secretary of the Odessa Forensic Science Institute of the Ministry of Justice of Ukraine with a speech: *On the issue of environmental regulation when determining derived data when conducting forensic engineering and environmental examinations*; leading specialist in the organization of scientific work of the Kirovohrad SRFC of the MIA of Ukraine, candidate of legal sciences, associate professor **Oleksandr Kolomojets** considered *Impact of hostilities in Ukraine on the state of ecology: damage assessment and elimination of consequences*; forensic expert of the National Center of Forensic Expertise under the Ministry of Justice of the Republic of Moldova **Ana-Maria Cișleanu** presented the speech: *Utilization of agricultural waste*; doctor of biological sciences, forensic expert of the National Center of Forensic Expertise under the Ministry of Justice of the Republic of Moldova, **Viorica Trifushan**, devoted her report to the topic: *Illegal role of bioindicators for assessing the degree of environmental pollution in the Republic of Moldova*.

On behalf of the NSC «Hon. Prof. M. S. Bokarius FSI» abstracts of reports for publication in the collection of materials of the International Round Table “Development of Forensic Environmental Expertise – an Important Factor in Environmental Protection” were prepared and sent by: Deputy Director for Expert Work, Candidate of Legal Sciences, Senior Researcher, Honored Lawyer of Ukraine **Ihor Bohdaniuk**; Principal Researcher, Doctor of Law, Professor **Iryna Petrova** and other institution researchers.

For Ukrainian researchers, the annotated topic of this round table is extremely important, because due to the Russian aggression, numerous shelling fires, water resources and soils are polluted – after all, entire ecosystems have been destroyed, not to mention threats to the nuclear energy of Ukraine, etc. Information about the latest theoretical and practical developments of foreign colleagues will be useful to the staff of NSC «Hon. Prof. M. S. Bokarius FSI» while forensic expert activity. We are grateful to our colleagues from Moldova for the opportunity to participate in an event of such a high scientific level.

*Information was prepared by **Denis Chekin**,
Researcher of NSC «Hon. Prof. M. S. Bokarius FSI»*

Requirements for Research Papers

Requirements for content

According to the Edition subject matter, content regarding coverage of criminalistic current issues, relevant issues of performing various types of forensic examinations and specific expertise application in legal proceedings is published on the pages of the Scientific Edition.

Based on research, presentational, evaluative and communicative functions of the Scientific Edition, **research papers** (where an author outlines main work outcomes); **research and methodological papers** (where an author analyses methods, processes, tools helping to achieve certain scientific results); **research and theoretical papers** (texts where an author presents results of theoretical ways for problem solution); **research and practical** (articles where an author describes his personal practical experience and performed scientific experiments), **review research papers** (dedicated to evaluation, conclusions, overview, analysis of earlier published information). The Editorial Board is also interested in **debatable articles, research ideas or short reports**: results of an experiment, personal experience, etc. Scientific style of the content presentation (accuracy, logic, conciseness, clarity, connectivity, integrity, completeness) and its high scientific level.

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- Formulation of research problem, its connection with scientific and practical interests (it is necessary to reveal essence and state of the scientific problem, theoretical and practical significance of a research, connection with scientific

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- Main content presentation with obtained results (to reveal important theoretical positions and research results, analyze scientific facts, ideas, thoughts, regularities, concepts, as well as trends of further topic development, emphasizing personal contribution of the research author(s));
- Conclusions (main research results in a clear, consistent, logically presented form in compliance with set goal);
- References (the list of used sources transliterated according to the Roman alphabet, for example, on the site of Vernadsky National Library of Ukraine: <http://nbuv.gov.ua/node/929>);
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Article is submitted for publication in Ukrainian or English.

Text of the article should be printed using the Microsoft Word processor; A4 paper size; page orientation. Text should not contain hyphens and macros.

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Article title should be without acronyms and abbreviations.

If a research is executed within the framework of international projects (grants), then it should be mentioned.

Analyzing main researches on the article problematics, it is obligatory to consider the status of the issue in foreign and domestic sources (not less than 20 publications, at the same time the majority should be represented by international indexed editions). References to the author(s) personal scientific papers are allowed only if they do not exceed 10% of all references.

The article text should adhere to requirements for content, general rules of citation and references to used sources. Each quotation should be accompanied by a reference to the source which bibliographic description should be completed depending on its type (primary or secondary source) according to the National Standard of Ukraine ДСТУ 8302: 2015: *Information and documentation. Bibliographic reference. General terms and conditions of compilation*.

In bibliographic references, it is necessary to use footnotes or endnotes involving separate reference to each source. While numbering references, authors should use continuous numbering (in Arabic numerals) throughout the article text.

Illustrations (tables, diagrams, graphics, schemes, formulas) can be submitted in the text article. Illustrations should be delivered in separate files. They should be provided in a format enabling to format (for translation

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**THEORY AND PRACTICE OF FORENSIC SCIENCE
AND CRIMINALISTICS**

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