

# *Autonomous robot as a source of increased danger in law: harm prevention problems*

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**Abstract** — The law has a number of structures, the use of which, by analogy with the law, is possible in the conditions of the gradual introduction of autonomous robots into economic turnover. Will today's legal regulation be able to handle the issues of preventing harm with robots increasingly wide-spreading and increasingly autonomous. Analyzing and summarizing modern views of scientists regarding the concept of a source of increased danger, the practice of applying the relevant legal norms, as well as the analysis of legal provisions related to autonomous robots, we draw conclusions that it is impossible to classify autonomous robots as traditional sources of increased danger and it is objectively needed to identify them as independent objects of law – autonomous sources of increased danger or sources of superdanger. The work substantiates the necessity of exempting the owners of such sources from increased responsibility (liability without fault) from the moment the robot starts working autonomously. It substantiates the necessity of creating a comprehensive system that ensures the safe operation of autonomous robots, which includes mandatory state certification of such objects, obtaining special permits by the owners of such objects, and mandatory insurance of risks. The proposed changes to the structure to prevent harm, consisting in the consolidation of certain provisions prohibiting activities in case the operating conditions of autonomous sources of increased danger are violated, in the proclamation of the presumption of guilt of the owner will create optimal conditions to minimize offenses.

**Keywords** — *autonomous robot, source of increased danger, prevention of harm, danger of harm, tort, compensation for harm, liability.*

## I. INTRODUCTION

The European Union governing bodies and the scientific community are actively discussing the prospects of introducing a new approach to determine the place and role of artificial intelligence and robotics systems in the legal space, in particular, with the aim to resolve the distribution of tort liability with their participation and preventing harm in terms of legislation [10, R. 393]. Resolution of the European Parliament of February 16, 2017 on European civil law in robotics [4], as well as a number of researchers propose to use the concept of “electronic entity” and endow it with limited legal capacity or use the concept of “limited form of legal

entity” [3, P. 499] and envisage the possibility of such entities incurring tort liability, but the impossibility of criminal prosecution.

In Russia, the Draft Law "On Amendments to the Civil Code of the Russian Federation regarding Improving the Legal Regulation of Relations in the Field of Robotics" [5], as well as the Model Convention on Robotics and Artificial Intelligence [11] were prepared. Design developments and innovation ideas in publications cause numerous discussions in the scientific community. A number of proposals contained in them create obstacles to the effective prevention of harm in the age of autonomous robots distribution. This applies, for example, to the term “intelligent robot” used in publications, which will not allow distinguishing between “smart” and “intelligent” robot and brings only additional difficulties to the terminology; this also applies to the interpretation of the laws by A. Asimov to proclaim the principles in legal acts that do not correspond to reality and, if we consolidated them, would not allow us to adequately assess the safety of autonomous robots being created [1,12,13].

The current legislation contains a number of structures, the use of which seems possible in relation to the use of an autonomous robot. Here we mean the concept of "source of increased danger", which applies to modern technical means, including cars. In a glancing understanding, it is obvious that an autonomous robot, which is a complex technical device with an artificial intelligence system, from the point of view of law is nothing but a source of increased danger. However, is it possible in the future as autonomous robots are developed and distributed to talk about the sufficiency and optimality of the design of a source of increased danger in determining the subject of liability in case of harm and in cases the institution of harm prevention is used?

Sensational cases of harm, including fatalities, which occurred when using autonomous cars pose a difficult task for the science of law [16]. Determining the dependence of the categories of “danger” and “grounds and extent of liability”, determining the proper subject of liability is just a small part of the tasks, solutions of which are sought by A. Ivanov [6], E. N.

Iriskina, K. O. Belyakov [7. P. 70], Matthew U. Scherer, J.K.C. Kingston [8. P. 269], Bert-Japp Koops, Mireille Hildebrandt, David-Oliver Jaquet-Chiffelle, Paulius Čerka, Jurgita Grigienė, Gintarė Širbikytė [14. P. 378], Nicolás Lozada-Pimiento and others.

The aim of our study is to determine the possibility of using the structure of a source of increased danger applicable to autonomous robots in the conditions of solving problems to prevent harm.

Objectives: identify the main characteristics of autonomous robots as objects of law; determine the relationship between the concepts of an autonomous robot and a source of increased danger; identify harm prevention problems.

## II. THE CONCEPT OF AN AUTONOMOUS ROBOT AND A SOURCE OF INCREASED DANGER. HARM INFLICTION LIABILITY ISSUES

In the national standard GOST R 60.3.4.2-2017/ISO 9409-2: 2002. "Robots and robotic devices. Industrial handling robots. Mechanical interfaces. Rods" as well as the Russian national standard "Robots and robotic devices. Safety requirements for industrial robots" reads that a robot is a drive mechanism programmable along two or more axes, having some degree of autonomy, moving inside its working environment and performing tasks according to its intended purpose. Autonomy, according to the aforementioned regulatory act, is the ability to perform tasks according to their intended purpose, based on the current state of the product and the features of data reading without human intervention. Thus, an autonomous robot is not only software (computer programs that support artificial intelligence) and not only hardware (physical component). This is a system that improves its physical actions in space and makes autonomous decisions. The autonomy level of control systems of modern self-driving car in accordance with JE016 International classification of the automation level of motion control systems is SAE 2, some models – 3, which does not allow the car owner to completely stay aside from control [17. P.305]. When the owner turns the auto mode on, despite the low SAE levels, the key parameter for an autonomous object is its safety for the owner and others. And the question of whether, for example, a robot vacuum cleaner or an airliner is completely autonomous, goes to the backstage since the potential risk of causing more harm from the wrong actions of the latter is obvious. Accordingly, the definition of a classification or specific types of autonomous robots for law is of secondary importance due to the need to create effective legal mechanisms to prevent harm and compensation for harm caused by any autonomous robot. *Therefore, the concept of an autonomous robot for law has to include four constituents: hardware, software, autonomy and safety.*

Options for solving a specific practical situation for the robot are formed from limited examples of its own experience and embedded parameters in the software. Meanwhile, the solution for a real life incident in some cases requires the use of a person's knowledge and worldview, based not only on legal norms, but also on moral values, the foundations of society, and, ultimately, on the intuition, into categories unknown to artificial intelligence. As, for example, in the movie *I, Robot*, where the main character played by Will

Smith is distressed that when saving the drowning people, an autonomous robot saved him, having estimated that he had a better chance of recovery after the accident than a child drowning nearby. Accordingly, those decisions that are made by an autonomous robot have to be regarded as "reasonable", "acceptable" not only by society, but, most importantly for the purposes of our study, by the owner of such a robot. If the owner of such an object was against the choice made by the robot, the legal issue of separating the will of the owner from the "artificial will" of the robot inevitably arises.

In foreign literature, the idea of the Resolution of the European Parliament of February 16, 2017 on European civil law in robotics on the allocation of autonomous robots as special legal persons is actively supported and developed. Paulius Čerka, Jurgita Grigienė, Gintarė Širbikytė note that the legal regulation of the interaction of people and technologies will be much less complicated if artificial intelligence is endowed with legal personality [14. P.388]. This will enable legal separation of autonomous robots from operators, manufacturers and owners. Without delving into polemics regarding the status options of autonomous robots (objects or quasi-objects), we note that these features of such objects undoubtedly do not allow the application of rules similar to other objects of law even in conditions of low autonomy, since an autonomous lawn mower and a lawn mower devoid of elements of the artificial intelligence system, are completely different objects in the material world perspective. The latter will never make a decision on its own to cut the neighboring flower garden, for it is controlled by the owner.

The concept of an autonomous robot is closely related to safety. The concept of safety is given in special legislative acts (for example, in the Federal Law of July 21, 1997 No. 116-FZ "On Safety of Hazardous Industrial Facilities"). Given that any object that has a high risk of inflammation, explosion hazard or the risk of harm to human health and life or the environment can fall under a special legal regulation, the possibility of classifying autonomous robots as objects representing danger is unambiguous. Liability of the owner of such an object occurs regardless of fault (increased liability). In civil law and scientific literature, such objects or actions related to their use are referred to as a source of increased danger. A number of researchers see such sources as ones possessing harmful properties that are uncontrolled or not completely controlled by humans, which, during operation, creates a possibility of accidental harm, even when taking measures to prevent it [19]. Others – as a certain type of activity related to the possession and use of harmful objects, the parameters of which at the appropriate levels of development of science and technology exclude the possibility of complete control by humans, which creates an increased danger for others [18]. Moreover, in judicial practice, the interpretation of the source through the lens of human activity has become more widespread [15].

The concept of a source of increased danger is evaluative in nature and in each specific case of harm, the court, based on expert opinions and other information, makes a decision on recognizing or not recognizing the object as a source of increased danger. Scientific and technical progress is constantly expanding the range of complex technical objects and potentially causes an increase in the scale of their negative

effect.

The analysis of judicial practice [20] and scientific papers lets us note that the harm of objects of the material world appears at the time of their operation, these objects are not recognized as a source of increased danger when they are at rest [2. P.28]. In relation to the subject of this study, we can explain that an autonomous car in manual control and moving along the highway is already a source of increased danger. This means that in case of harm, the owner is held liable without fault (increased liability), since it is assumed that, when buying a car, the right to drive it, the owner was aware of the increased danger of the object and had to make every effort to prevent possible harm. So what happens from the legal viewpoint when autopilot in moving vehicles is turned on? At the present stage of law development – nothing. It is widely believed that due to the low level of automation of control, the driver has to control the car, keep one's hands on the steering wheel and react to a dangerous situation by taking control at any time. Therefore, the manufacturer is not liable. However, what is the point of the auto mode, if the control from a human is the main cut-off point for making the manufacturer liable for the harm? Besides, the level of autonomy of robots will continue to grow from year to year. It seems more correct from the point of view of common sense to evaluate the inclusion of an auto mode as an action that ceases the possibility to apply the “traditional” institution of liability for harm caused by activities that create an increased danger to others. At this moment, the operation of robot by human is over. Therefore, an autonomous robot is not just a source of increased danger. Let us call it *a source of superdanger or an autonomous source of increased danger*. Its legal status will be special. An autonomous robot is an autonomous source of increased danger from the moment of its creation, but when the autopilot is turned off, the rules on ordinary sources of increased danger apply to it (Article 1079 of the Civil Code of the Russian Federation), from the moment the autopilot is turned on, other rules should apply. According to Mark A. Geistfeld, the elimination of human control should shift the liability to the manufacturers of autonomous robots [9. P.1619]. We would note – shift the liability to other persons, but not to the owner of such a robot. Matthew U. Scherer convincingly illustrated a possible way of distributing tort liability between an organization specially created for certification of all robotics objects, suppliers, and consumers of such objects [10. P.393]. The main goal of identifying special objects that have an increased danger to others is the fastest possible compensation for the harm caused by their operation. The identification of the responsible person, the amount of damage and the possibility of actual compensation have to occur in a short time. Given these goals, as well as artificial intelligence capabilities, Matthew U. Scherer suggested to create a system of voluntary certification of all autonomous robots in a single center and to distribute tort increased liability jointly and severally between the manufacturer, supplier, seller in the absence of a certificate. It seems that the system proposed by this author needs some modification. Autonomous robots should not be subject to voluntary, but mandatory state certification in the relevant organizations. Individuals and legal entities, after acquiring certified robots, must obtain the rights (permits) for their operation (for unmanned aerial vehicles,

autonomous cars, robotic nurses, etc.) in order to minimize the possibility of using robots for other purposes in violation of operating rules. When purchasing autonomous robots, a system of compulsory insurance of risks of harm has to be in place. In the proposed option, the quality of the products will be confirmed by organizations certifying robots, and the capacity of consumers and their familiarization with the operation manual – by rights (permits) for operation. Guaranteed compensation for harm to both owners and third parties – by the insurance system. Then, in cases of damage, after the payment of insurance compensation, the insurance company and the victim (if it is necessary to cover large expenses or compensation for moral damage) will be able to present their claims to manufacturers and organizations that certify robots (regardless of their fault) and to owners of autonomous robots (if any operational violations or reprogramming are proved). Thus, *autonomous robots as objects of increased danger need to have a system at the state level that ensures the safety of such objects, controls the operation of such objects and provides the ability to meet the requirements of victims promptly. The distribution of liability has to be different rather than regarding the traditional sources of increased danger. No-fault (increased) liability has to be borne by manufacturers and certification organizations, and the owner only has to be held liable if fault is present.*

Revisiting the concept of a source of increased danger, it should be noted that the classification of autonomous robots suggested by us as a new type of object of law – *sources of superdanger or autonomous sources of increased danger* does not conflict with the previously indicated approach that dominates in judicial practice – *the source of increased danger* is actions and not objects. An autonomous robot in disabled state in legal terms is similar to a normal car while parked with the engine off. This is just a thing. An autonomous robot with auto mode on can cause harm to others with its own actions, which, as we noted earlier, are legally separated from the actions of its owner. Since the actions of a non-entity of law (at the present stage of the development of law, autonomous robots have not received the status of entities) cannot have an independent legal assessment, in relation to a phenomenon completely new to law, we can take it as an axiom that an autonomous robot (its active mode) is exactly an autonomous source of increased danger.

### III. PREVENTION OF HARM IN THE CONDITIONS OF THE SPREAD OF AUTONOMOUS ROBOTS

Prevention of harm – a comprehensive legal institution aimed at preventing and stopping offenses and minimizing their negative consequences. Its application is based on the norms of the Civil Code of the Russian Federation and the Administrative Offence Code of the Russian Federation. The norms of civil law mean that the prevention of harm can occur by issuing a court decision to terminate or prohibit activities in cases of a danger of harm in the future or a threat of new harm. Article 1065 of the Civil Code of the Russian Federation does not contain specific requirements for the definition of activities creating a danger of harm in the future. It is only mandatory to prove the reality of the danger of harm in the future by specific activities in accordance with paragraph 28 of the Decree of the Plenum of the Supreme Court of the Russian Federation dated

November 30, 2017 No. 49 “On Some Issues of the application of the Law on Compensation of Damage to the Environment”.

The administrative law contains an indication of the possibility of suspension of activity until the violation of the rules of operation of various objects or the conditions of permits issued for a certain type of activity are eliminated.

It is obvious that the operation of a hazardous industrial facility in the absence of a permit creates a real threat of harm to the life and health of citizens, the environment, and property. In terms of the suggested system where the owners of autonomous robots will need to obtain permission for their operation, the absence of such permission will mean failure to meet the requirements and conditions for a person to carry out activities related to the use of such robots, which can lead to accidents, destruction of technical devices, equipment, facilities, to accidents, explosion, fire and other.

At the same time, if an autonomous source of increased danger is used in violation of the conditions of the issued permits, the risk of harm in the future also increases: the threat turns from a potential into a real one. Therefore, the expansion of the scope of application of autonomous robots has to occur simultaneously with the intensive implementation of harm prevention practice.

Today, this system has a number of shortcomings that significantly affect its efficiency. Let us consider in more detail the possible options of using the system to prevent violations in the future with an increase in the number of autonomous robots.

In terms of the subject in question, administrative suspension as a way to prevent harm, as enshrined in the articles of the Administrative Offence Code of the Russian Federation, can be widely used. Currently, the prevention of harm through administrative and legal mechanisms is being implemented in the suits of state bodies to ban the operation of hazardous facilities and to suspend the activities of economic entities based on Articles 8, 13, 8.2, 8.21 of the Administrative Offence Code. In the course of regular and mandatory inspections, when detecting offenses, officials turn to the court with the specified requirements. If the operation requires a permit and a quality certificate for a specific robot, in the absence of these documents or in violation of the operating conditions, a relevant act and a claim to the court will be made to suspend the operation of the autonomous robot by a specific entity, whether it is a citizen or legal entity. The introduction of a separate article providing such authority for state bodies will be a necessary condition for the existence of a state control system not only at the stage of purchasing robots, but also in the process of their use. However, the introduction of liability for these violations will be ineffective in itself, and a non-alternative sanction in the form of suspension of activity will be required. In cases where the sanction will contain the possibility of replacing the suspension of activity with a fine, the goals of preventing harm will not be achieved.

Unlike the administrative suspension, civil suspension of activity, as well as its termination, may be appointed by the court in addition to compensation for harm, and the prohibition of activity may be imposed in case of danger of harm in the

future, that is, in the absence of harmful consequences. Accordingly, the sanctions of the civil law (Article 1065 of the Civil Code of the Russian Federation) on the prevention of harm are wider than its analogue in the Administrative Offense Code.

The literal interpretation of the provisions of Article 1065 of the Civil Code of the Russian Federation reveals the following points:

- activities that create a danger of harm in the future may be prohibited at the suit of a person concerned;
- the operation of an enterprise, structure, other production activity by which harm continues to be caused or a new harm is created, may be suspended or terminated at the suit of a person concerned (the harm may also be compensated).

In civil law, such claims can be issued by any person, including officials of state bodies. Therefore, this procedure for protecting the rights of others can become universal.

The solution to the problem of preventing harm in case of violating the operation of autonomous sources of increased danger will be possible if the provision of the rule of law under consideration is supplemented by the condition that the operation of an autonomous source of increased danger, which continues to cause harm or creates the threat of new harm, can be suspended or ceased at the suit of a person concerned (damage may also be compensated). Thus, the specification of the provisions of the Civil Code of the Russian Federation will make it possible to use this institution not only in the requirements to prohibit activities, but in the requirements to terminate activities if there has already been a fact of harm.

Speaking of the distribution of autonomous robots, it should also be noted that the use of such an object by any person without the necessary permission or in violation of the conditions of such a permit should not be made dependent on the owner's guilt. In the first section of the study, we suggested the option when compensation for harm in tort would be reimbursed at the expense of the owner only if one is guilty and only in part uncovered by compensation from compulsory insurance of risks. In the case of preventing harm in the absence of permission or in case of violations of a robot operation, the owner's fault is assumed. Moreover, the presumption of the offender's guilt has to exist, in accordance with which one must prove one's innocence independently. This approach is justified, since entities acquiring an autonomous source of increased danger are required to take all precautions necessary in order not to cause any harm. This presumption has to be explicitly stated in Article 1065 of the Russian Civil Code. All possible methods of suspension, termination or prohibition in a practical form will be expressed in the forced seizure of an autonomous source of increased danger from the owner by the authorities. In cases of suspension, termination – for a specified period, in the case of a prohibition – the final seizure with payment of appropriate compensation.

Thus, the system of preventing harm for the successful implementation of autonomous sources of increased danger in the legal matter needs a number of improvements related to the

consolidation of the presumption of guilt of the owner in the right to prevent harm in the norms, specifying the possibility of suspension or termination of the operation of autonomous robots, with the consolidation of no-alternative sanction in the administrative legislation in the form of suspension of activity in case of violation of the rules on receiving permission to operate an autonomous robot, or violation of the rules for its operation.

#### IV. CONCLUSION

Spreading autonomous robots poses a huge challenge for the science of law. The introduction of any additions or changes to the legislation, the formation of new regulation rules should occur in a comprehensive manner involving various institutions and branches of law. The solutions that the study suggests concerning the problems that law enforcement is about to face with the introduction of a new object of law into legal matter, its isolation as a special source of increased danger, have to occur only in conjunction with the establishment of state control at the stages of production, acquisition and operation in accordance with the issued permits.

The legal status of autonomous sources of increased danger has to differ from the sources of increased danger known to the law and include the release of owners from increased liability in case of tort. On the contrary, toughening the requirements for the owner of an autonomous robot in relation to the institute for preventing harm (introducing the presumption of guilt) will create the conditions for the effective prevention of offenses.

The methods of prevention of harm contained in laws: termination, prohibition, suspension of activities taking into account the proposed improvement options will allow the safe use of autonomous sources of increased danger (sources of superdanger).

On the whole, the introduction and distribution of autonomous robots gradually entails a change in emphasis in the distribution of liabilities between entities operating hazardous objects and passive participants of the process (passengers, pedestrians). Previously existing concepts put the owner of dangerous objects at the forefront, prescribed rules of conduct and increased responsibility for them. In the conditions of the separation of the will of the owner from the "artificial will" of an autonomous robot, priority should be given to the responsible attitude of the subjects to the surrounding reality.

#### Acknowledgment

The study was carried out with the financial support of the Russian Federal Property Fund and the Government of the Orenburg Region in the framework of the scientific project No. 19-411-560002 "Prevention of environmental damage in legal science and practice: interindustry approach (exemplified by Orenburg Oblast)"

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