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On Challenges for Penal System Employees when Countering Illegal Unmanned Aircraft Flights

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Abstract

Introduction: the article analyzes modern challenges related to the threat of the use of unmanned aircraft for illegal purposes: delivery of prohibited items to convicts and monitoring of the service by the personnel for supervision and protection at penitentiary facilities. This is becoming especially relevant for correctional facilities of the Federal Penitentiary Service of Russia. The authors emphasize the need to develop and optimize mechanisms to counter possible threats. *Purpose*: to identify problems that arise when intercepting flights of unmanned aircraft on the territory of penitentiary, and to develop measures for boosting security. *Methods*: analytical, legal, statistical, expert, and forecasting. *Results*: the study shows that there are problems related to legal, technical and organizational aspects of countering the threats posed by unmanned aircraft to ensure proper functioning of the penal system. The dynamics of the illegal flight suppression demonstrates the formation of a stable negative trend, while the approaches to protecting correctional facilities do not fully take into account potential risks. *Conclusions*: to ensure security of penitentiary institutions, one needs an integrated approach that includes a legal framework, training and timely professional development of correctional personnel, and introduction of modern technologies for tracking and blocking (suppressing) flights of unmanned aircraft.

Keywords: unmanned aircraft; security of correctional institutions; protective systems.

5.1.4. Criminal law sciences.

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Introduction

The Federal Penitentiary Service of Russia, as a federal executive body responsible for monitoring and supervising the execution of criminal penalties against convicted persons and the detention of persons suspected or accused of committing crimes, is obliged to ensure law and order and legality in correctional institutions and pre-trial detention centers, and the safety of persons held in custody, as well as employees of the penal system of the Russian Federation, officials and citizens being on the territory of these institutions. The implementation of these tasks is facilitated by the use

of forces and means available in the department and sometimes in interacting bodies. In addition, the introduction of modern technical means is an essential element of strengthening law and order in correctional facilities. This point is emphasized in the Concept for the Development of the Penal System of the Russian Federation for the period up to 2030. The use of technical means increases the effectiveness of countering both external and internal threats at subordinate facilities.

Research

The use of unmanned aircraft to transport prohibited items to the territory of penitentiary institutions is a new challenge for activities of the penal system. There is also the potential for these devices to be used to deliver explosives and commit terrorist attacks. In this regard, the issues of countering these threats are becoming crucial.

Countering illegal flights of unmanned aircraft means taking measures when there is a threat of an invasion of unmanned aircraft into the territory of a protected facility or an immediate attack. Counteraction measures are divided into two main stages: detection (recognition, classification) of the attacking means and application of counteraction measures [1, p. 95]. However, it is not always possible to apply these measures in the activities of penitentiary institutions.

At the same time, it should be noted that the number of uses of unmanned aircraft for illegal activities is growing, which is confirmed by statistics provided by regional divisions of the Federal Penitentiary Service of Russia: in 2015 – 8 cases, in 2017 – already 26. The 3.25-fold increase in the number of incidents in three years clearly demonstrates the formation of a stable negative trend and indicates the growing attractiveness of this technology for offenders.

According to some researchers, the absence of serious legal restrictions on the acquisition and flight operations of unmanned aircraft also triggers smuggling across the state border of the Russian Federation [2, p. 225].

With the increased activity of citizens using the devices in question, it is necessary to develop additional measures to ensure security and prevent the delivery of prohibited items to correctional institutions. The following measures are envisaged in the Concept for the Development of the Penal System for the period up to 2030:

– implementation of technologies to detect and neutralize unmanned aircraft moving over correctional facilities;

– improvement of security and monitoring facilities, which will make it possible to quickly identify violations and take measures to prevent them;

– training of personnel to counteract new technologies that can be used to violate the regime and distribute prohibited items.

Cases of confiscation of unmanned aircraft in the Bryansk, Tomsk, Volgograd oblast, Kamchatka Krai and other regions of Russia indicate a significant geographical prevalence of the problem. The use of drones to deliver prohibited items shows that penitentiary institutions face challenges that require an integrated approach to ensuring security, as well as expanding technical capabilities and professional training of employees [3–8].

For the legal suppression of illegal flight of unmanned aircraft and the use of airspace in the territories of correctional facilities, pre-trial detention centers and adjacent territories where regime requirements are established, the Ministry of Justice of Russia adopted the order No. 370 of December 11, 2023 “On approval of the Procedure for making decisions on the suppression of the functioning of unmanned aerial, underwater and surface vessels and vehicles, unmanned vehicles and other automated unmanned complexes on the territories of correctional facilities, pre-trial detention centers of the penal system and the territories adjacent to them, where regime requirements are established, as well as a list of officials of the penal system authorized to make such a decision”.

Key requirements of this order can be described as the determination of officials authorized to make decisions on the suppression of flights of unmanned aircraft, actions of employees directly involved in its implementation, and the procedure for registering relevant information.

In particular, the list of officials authorized to make decisions on the suppression of flights of unmanned aircraft includes:

– a head of the institution;

– a duty assistant to the head of the institution;

– a head of the territorial body or his deputies (during the period of the special conditions regime).

In our opinion, these officials are granted the right to make appropriate decisions due to their following official and personal characteristics:

– responsibility for ensuring safety, security, regime and organization of supervision in relevant institutions;

– knowledge and skills of step-by-step application of response measures in the event of a complication of the operational situation (emergency cases);

– granting rights to make managerial decisions that are complex in nature (announcing the gathering of personnel and arrival at the service, reshuffling personnel, managing forces and means at their disposal, etc.);

– competent interaction with other law enforcement agencies and institutions on performance issues;

– the right to impose a regime of special conditions to manage the current situation (including the introduction of restrictions).

At the same time, the identification of a limited number of officials authorized to make decisions on the destruction of unmanned aircraft, in practice, can significantly slow down the actions of employees of institutions who have discovered illegal flight over the institution and adjacent territories where regime requirements are established. This category primarily includes employees who protect facilities and monitor suspects, defendants, and convicts. In addition, there is a special category of employees whose actions cannot be implemented without a decision by authorized persons to neutralize unmanned aircraft. These are employees who carry out security and supervision at facilities remote from institutions or temporary facilities, that is, at a distance from the place of permanent deployment of the institution. Such a delay in making a decision to stop the flight of unmanned aircraft by an authorized person may be due to objective reasons: a lack of radio and (or) telephone communication caused by technical problems, damage to communications due to adverse weather conditions, illegal actions, etc. Also, alternative means (methods) of communication do not always exist at remote facilities of the Federal Penitentiary Service of Russia.

Thus, it may take several minutes to report to the appropriate authorized official and receive an order to stop the flight of an unmanned aircraft from the moment of detection of an illegal flight of an unmanned aircraft. At the same time, the rapid flight dynamics of modern unmanned aircraft, their speed and ability to change the flight path leave little time for the personnel on duty to take retaliatory measures [9, p. 327]. These circumstances make it easier for offenders to illegally deliver prohibited items to the territory of penitentiary institutions, help to avoid responsibility established by law and further commit illegal acts.

Comprehensive legal, organizational and technical solutions are needed to improve the activities of penal institutions and improve existing measures to combat illegal flights of unmanned aircraft:

In order to improve regulatory legal acts, in particular the above-mentioned order No. 370, we propose to exclude a specific list of officials authorized to make decisions on the suppression of drone flights. In our opinion, this right, in accordance with articles 12, 13, 15 of the federal Law No. 197-FZ of July 19, 2018 “On service in the penal system of the Russian Federation and on amendments to the law of the Russian Federation “On institutions and bodies executing sentences of imprisonment”, should be possessed by any employee of the penal system.

Let us consider a situation where an employee, being off-duty, detects the flight of an unmanned aircraft. In order to stop the flight, he/she must receive an appropriate order from an authorized official. At the same time, for objective reasons, he/she does not have special means of communication (radio station and other means of communication) that allow him/her to promptly report to the authorities and obtain the necessary permission. As a result, the lawful suppression of these flights by available means, but in the absence of communication with authorized officials, becomes impossible. Amendments to the order No. 370 would eliminate existing legal shortcomings and increase

the effectiveness of countering illegal flights over the territories of penal institutions, including at temporary facilities.

To select optimal ways to counter the flights of unmanned aircraft over the territories of institutions of the Federal Penitentiary Service of Russia, these devices are analyzed and the following types of devices are identified:

– unmanned aircraft of the aircraft type. These vehicles are typically characterized by flight duration, high maximum altitude, and high speed. They are capable of long-distance flights and are usually used to monitor large areas or perform tasks requiring high-speed movement;

– helicopter-type unmanned aerial vehicles. The main advantage of these devices is their ability to hover at one point and high maneuverability. This makes them ideal for tasks where precise stabilization in the air is required, such as when shooting videos or photographs from the air, as well as when taking various measurements at a fixed point;

– multi-rotor unmanned aerial vehicles. Unmanned vehicles with multiple rotors belong to this category. For example, quadrocopters are equipped with four propellers, while multicopters – with more ones. The main feature of these devices is the ability to balance the reactive moments by rotating the propellers in pairs in different directions or tilting the thrust vector of each propeller to change direction or stabilize flight.

Universal detectors (mobile, stationary), radio signal suppressors, special technical means and laser installations can be used to detect and neutralize drones in the airspace.

In all recorded cases, multi-rotor unmanned aerial vehicles are used on the territory of penitentiary institutions. Flight suppression is carried out by technical means (only in certain regions of the Russian Federation) and mechanical means. Such devices as the Bulat mobile detector and the Harpy mobile radio signal suppressor are used as technical means. The mechanical method consists in the targeted and accurate use of improvised means by employees of institutions. In addition, operators (offenders) are detained to prevent flights of unmanned aircraft. There are also cases of loss of flight control with a further fall of the device (weather conditions, propellers touching overhead communications, etc.).

Based on the analysis of average performance indicators, it can be concluded that the most common multi-rotor unmanned aircraft can reach speed from 40 to 80 km/h and have a range of up to 10-20 km or more. If the launch point is located within a radius of 5 km from the object, the flight time will be approximately 4-8 minutes. The approximate time to determine the reset point and reset takes 0.5–2 minutes. Taking into account the deployment, launch and completion of the flight, the total time may range from 10 to 20 minutes. In addition, it is found that about 90% of the cases of prohibited item delivery are carried out at night, when the drone is not visible in the airspace. In turn, the territory of the institution has security lighting around the perimeter, which allows the operator (the offender) to accurately bring the aircraft to the desired point [10, p. 26]. In addition, we note the accuracy of dumping prohibited items on the territory of a penitentiary institution. Thus, the distance of deviation from the designated dumping site of a compact cargo (a bundle of five communications equipment measuring 120x70x54 mm, weighing 480 g) when dropped from a height of 80 m was 0.6 m, from a height of 200 m – 2.7 m. Thus, the delivery of prohibited items using unmanned aerial vehicles to the territory of an institution is usually safe for the operator, taking into account its distance from the facility, and effective (fast and accurate delivery to the designated location). Therefore, it is important to develop modern mechanisms for countering illegal flights of unmanned aircraft over the territories of penitentiary institutions, including for the delivery of prohibited items.

Such mechanisms should include organizational training of employees of institutions (especially security, regime and supervision units), acquisition of special technical weapons, joint exercises with cooperating law enforcement agencies, etc.

In addition to traditional counter-measures (fencing, video surveillance), other preventive measures should be used. For example, it is possible to single out physical protection of individual supervised facilities that are most susceptible to the delivery of prohibited items, in

particular, their equipment with mesh canopies (canopies) that create an obstacle to the dumping of goods from the air.

Among the measures of technical counteraction to illegal flights of unmanned aircraft, we note the use of technical means based on acoustic control of airspace, which make it possible to detect and warn of the approach of a drone due to the noise of its propellers. This method is currently not used in the penitentiary system, although such technical means proven themselves as detecting unmanned aircraft [11; 12, p. 32; 13, p. 1; 14, p. 131].

The means of acoustic control of the airspace should be used together with other mechanisms forming a whole system of counteraction. In particular, it is necessary to equip institutions with unmanned aerial vehicles and make appropriate changes to the organizational and staff structure of institutions. In this case, we propose to introduce a department for the use of unmanned aircraft in the staff structure of security units. It will be comprised of employees who know the legal basis for the use of drones, the system and features of ensuring the protection of facilities, and who are able to correctly qualify the current situation in the institution and in the surrounding area, where regime requirements are established. Employees should have the skills to safely manage devices, monitor airspace, and have appropriate confirmation of this qualification.

The creation of a specialized department for the use of unmanned aircraft will help ensure the most reliable protection of penitentiary facilities, detection of offenders, and reduction of the risks of damage in the civil law sphere.

In conclusion, it should be noted that countering illegal flights of unmanned aircraft by the staff of the Federal Penitentiary Service of Russia within the territories of institutions and relevant subordinate facilities is of both practical and scientific importance in the implementation of the functions assigned to the penitentiary service.

It is important to introduce clear, well-founded mechanisms for an effective and comprehensive response to potential threats (delivery of various dangerous items (including explosive ones), monitoring the organization of the institution's official activities, staff identification, etc.) for employees providing administrative functions, persons held in institutions, and others related to the use of unmanned aircraft by offenders.

In addition, it is necessary to monitor the technological development of unmanned aircraft systems that can potentially be used against activities of the penal system, and to make timely organizational and managerial decisions aimed at countering emerging threats for the proper execution of criminal penalties in the form of imprisonment or preventive measures in the form of detention.

In order to train the penal system personnel to counter illegal flights of unmanned aircraft within the relevant territories of institutions, it is necessary to supplement the existing curricula of educational organizations of the Federal Penitentiary Service of Russia with a discipline aimed at studying the use of unmanned aircraft and counteraction mechanisms. The study of this discipline is required not only for students enrolled in higher education programs, but also for those who enter the service and staff who upgrade their qualifications.

Thus, the approach to countering illegal flights of unmanned aircraft should integrate clear legal acts, modern technical means, efficient allocation of forces, and the educational process of students in educational organizations of the Federal Penitentiary Service of Russia. It will lead to improved activities aimed at countering illegal flights of unmanned aircraft and provision of legality and law and order in penitentiary institutions. In our opinion, this area of activity is promising and requires further scientific research.

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