

Практические аспекты экономической безопасности государства

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AVIATION FLIGHTS SAFETY AS AN ELEMENT OF NATIONAL SECURITY

БЕЗПЕКА АВІАЦІЙНОГО СУДНОПЛАВСТВА ЯК ЕЛЕМЕНТ НАЦІОНАЛЬНОЇ БЕЗПЕКИ

БЕЗОПАСНОСТЬ АВИАЦИОННОГО СУДОХОДСТВА КАК ЭЛЕМЕНТ НАЦИОНАЛЬНОЙ БЕЗОПАСНОСТИ

Summary. The criminogenic situation in the world in recent years is characterized as rather unstable, the number of threats of terrorist acts is constantly rising. In connection with this, the question arises about the introduction of measures to effectively combat such types of crimes. One of such measures is the development and improvement of technology regarding the organization and order of conducting inspection of passenger aircrafts for the presence of explosive devices in them. In addition, it is equally important to locate and dispose of additional explosive devices and explosive components of an explosive device that has already exploded. The article deals with the protocol of the activities of specialists in the inspection of aircraft in the event of a threat of an explosion and the procedure for the implementation of special inspections of aircraft during tactical exercises. The efficiency of the use of some modern technical means in the search for explosive devices during the inspection of air transport has been analyzed. The purpose of conducting a special survey of aircraft is: to ensure the safety of passengers and personnel on them; detection and disposal of explosive items that may be present in an aircraft, which may lead to an aviation event, as well as to minimize the consequences of such event.

Key words: flights safety, explosive objects, robots-sappers, survey of planes.

Анотація. Криміногенна ситуація в світі протягом останніх років характеризується як досить нестабільна, кількість загроз

терористичних актів постійно підвищується. У зв'язку з цим постає питання запровадження заходів, щодо ефективної протидії таким видам злочинів. Один з таких заходів – напрацювання та вдосконалення технології щодо організації і порядку проведення огляду пасажирських повітряних суден на наявність в них вибухових пристроїв. Крім того, не менш важливим завданням є пошук та знешкодження на місці вибуху додаткових вибухових пристроїв та вибухонебезпечних компонентів вибухового пристрою, що вже вибухнув.

У статті розглядається протокол дії спеціалістів з огляду повітряних суден у разі загрози вибуху та порядок здійснення спеціальних оглядів повітряних суден під час проведення тактико-спеціальних навчань. Проаналізовано ефективність застосування деяких сучасних технічних засобів при пошуку вибухових пристроїв під час огляду повітряного транспорту.

Ключові слова: *безпека польотів, вибухові об'єкти, роботи-сапери, огляд літаків.*

Анотація. *Криминогенная ситуация в мире в последние годы характеризуется, как достаточно нестабильная, количество угроз террористических актов постоянно повышается. В связи с этим возникает вопрос проведения мероприятий по эффективному противодействию таким видам преступлений. Одно из таких мероприятий – наработка и совершенствование технологии по организации и порядку проведения осмотра воздушного транспорта, а именно пассажирских самолетов, на наличие в них взрывных устройств. Кроме того, не менее важной задачей является поиск и обезвреживание на месте взрыва дополнительных взрывных устройств и взрывоопасных компонентов взрывного устройства, которое уже взорвалось.*

В статье рассматривается протокол действий специалистов при проведении осмотра воздушного транспорта в случае угрозы взрыва и порядок осуществления специальных осмотров воздушных судов во время проведения тактико-специальных учений. Проанализирована эффективность применения некоторых современных технических средств при поиске взрывных устройств при осмотре воздушного транспорта.

Ключевые слова: *безопасность полетов, взрывные объекты, роботы-саперы, осмотр самолетов.*

The purpose of this article: analysis of the actions of specialists in the explosive devices detection on airplanes.

Introduction. The number of crimes committed with the use of explosive devices has increased dramatically. By definition "explosive devices - industrial, handicraft and homemade products of a single use, the construction of which provides for the creation of the damaging factors of work due to the use of energy explosion of explosives or explosive mixture"[3].

Explosions in transport have become a widespread phenomenon. The intentions for the commission of criminal explosions are the most varied, and this may be the disruption of sporting events or terrorist acts aimed at destabilizing the situation in the state and "sowing panic" in society.

The most violent crimes committed using explosive devices are acts of terrorism committed during a large crowd of people [2].

According to the disposition of Art. 258 of the Criminal Code of Ukraine, a terrorist act, that is, the use of weapons, the commission of an explosion, arson or other acts that created a danger to human life or health or causing significant property damage or other grave consequences if such actions were committed in order to violate the public security, intimidation of the population, provocation of a military conflict, international complication, or in order to influence

decision-making or committing or not committing acts by state authorities or local self-government bodies, official We are these bodies, associations of citizens, legal entities, or attracting public attention to certain political, religious or other views of the perpetrator (terrorist), as well as the threat of committing these actions for the same purpose - are subject to criminal liability.

In order to effectively counteract this kind of crime, in the majority of countries of the world special explosive units are created in the structure of the police and security services. These units are equipped with the necessary equipment, including mobile robotic remotely controlled complexes (MRRCC), which provide effective and safe conduct of necessary work on the destruction and destruction of explosive devices.

An analysis of the practical activities of the relevant security services in Ukraine and similar units of other countries suggests that the use of passenger aircraft as objects for committing unlawful actions using explosive devices masked under the sports equipment or fan's attributes can be carried out as a result of the emergence of conditions conducive to:

- 1) this mode of transport is distributed throughout the world, and is widely used by sports (football) fans;
- 2) it is convenient for criminals to implement visual control of the situation on the aircraft or outside it, in order to choose the most successful moment for the operation of the explosive device.

Results

Algorithmization of actions of external visual inspection by specialist of an aircraft. This review is recommended by a group of up to 4 specialists. Of these: 1 specialist – senior group, 3 specialists – review team (Fig.1).

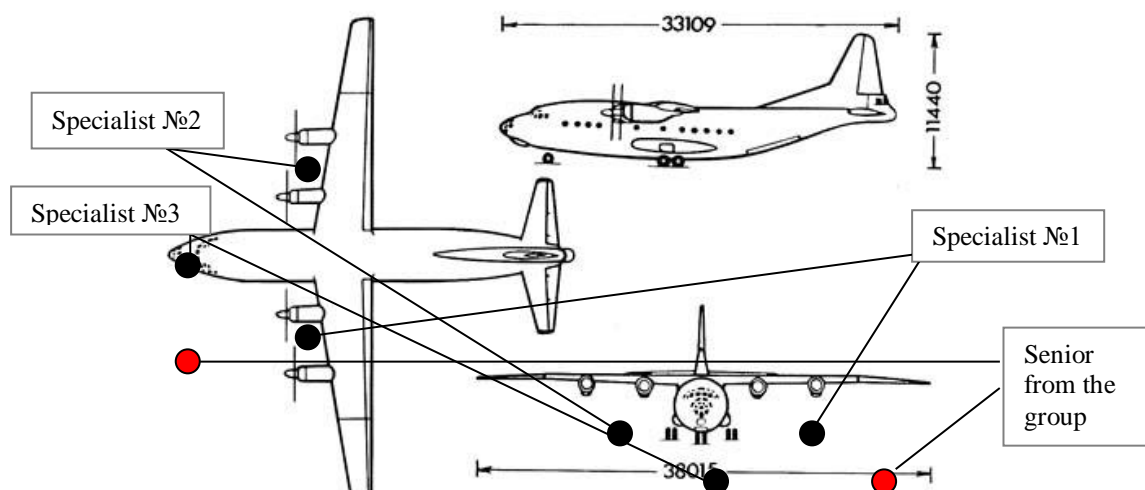


Fig. 1. The scheme of initial placement of specialists is as follows:

the senior from the group of specialists – at the command post; specialist №1 – near the front wheel of the aircraft under the fuselage at a distance of approximately 1 m; specialist №2 – at the rear wheels on the right side of the plane at a distance of approximately 1 m; specialist №3 – at the rear wheels on the left side of the aircraft at a distance of about 1 m

In this case, the senior from the group and specialists №1, №2 should be equipped with means of personal protection. In addition, specialists must have mirrors, video devices ("Telescope", "Vessel", etc.) or other devices for the inspection of hard-to-reach places in the design of the aircraft (bottom, chassis, technological hatches, etc.) and lanterns.

According to the team of the senior from the group, specialists №1 and №2, moving towards each other, begin simultaneous review of the design of the aircraft in the following tiers.

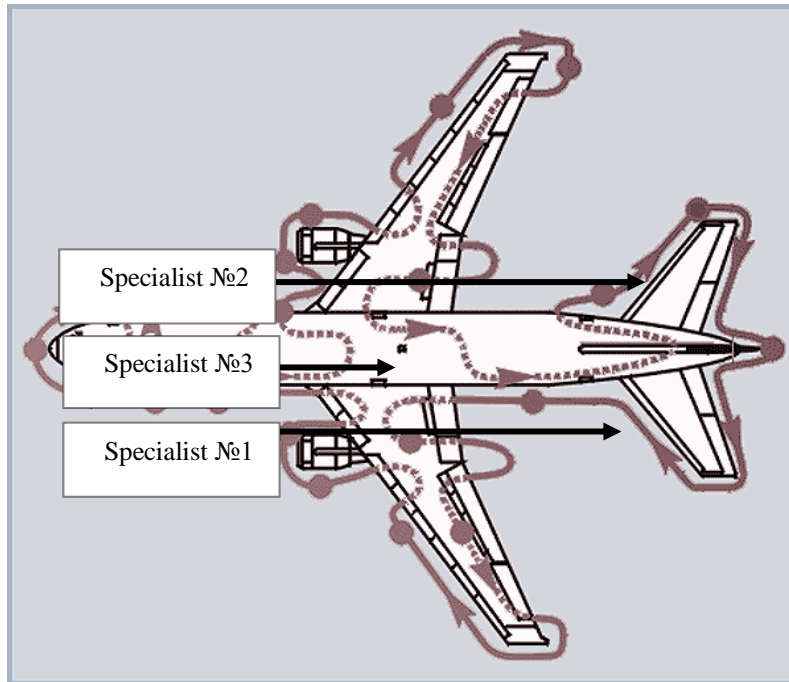


Fig. 2. Scheme of movement of specialists of explosives at an approximate review

An internal review of an aircraft is carried out without passengers and aviation personnel, which is evacuated in advance to safe places, according to the relevant plans. This review is recommended by a group of up to 3 trainees with compulsory use of a search dog. The route of the movement of professionals is carried out – in parallel on either side or to meet each other, with the premises being inspected from the bottom to the top of the tiers.

An internal review of an aircraft consists of reviews of the following zones (Fig.3):

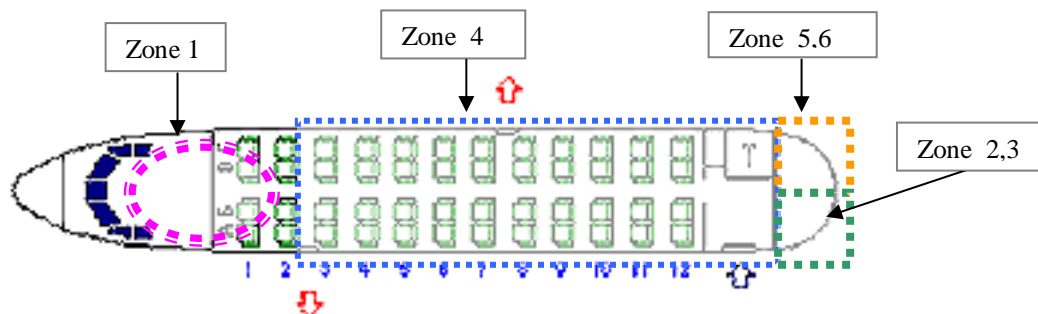


Fig. 3. Scheme of the internal arrangement of the premises of the aircraft

In the case of the detection of explosive devices it is necessary to determine the consequences that may arise in the event of an explosion. To do

this, you need to decide on: 1. Ability to tow an aircraft to a place of isolated (safe) parking. 2. Possibility of fusion of fuel (residue) from tanks of aircraft. 3. Moving an explosive device disguised. 4. Identify means of localization, destruction or disposal of an explosive device. Act strictly in accordance with the instructions.

Special survey of aviation objects. A special survey of aeronautical objects is carried out without passengers and aviation personnel, which are evacuated in advance to safe places, according to the relevant plans:

- it is necessary to restrict the access of persons who are not involved in carrying out works at the facility;
- leave the room doors open for inspection;
- to divide the inspection zone and determine the sequence of its implementation (performed at 3 levels): 1) from the floor level to the human belt; 2) from the waist to the head; 3) from head to ceiling;
- carry out a survey in a consistent manner, after the survey, mark the areas and premises that were groomed;
- a special survey of the aircraft object is made taking into account the construction features and in accordance with the instruction;
- any information about the possible placement of an explosive device masked under a sports equipment or a fan's attribute on an aircraft object is considered to be reliable until it is detected or full confidence in the unreliability of the information received;
- in the case of obtaining non-specific or contradictory information, all aeronautical objects that may reasonably be considered to be in danger are subject to a special inspection.

Actions of specialists in the detection of explosive devices

In the case of the detection of explosive devices it is necessary to determine the consequences that may arise in the event of an explosion. To do this, you need to decide on: 1. Ability to tow an aircraft to a place of isolated

(safe) parking. 2. Possibility of fusion of fuel (residue) from tanks of aircraft. 3. Moving an explosive device disguised as a sports equipment or fan's attribute to the place where it is disposed of. 4. Identify means of localization, destruction or disposal of an explosive device.

Technical equipment used by specialists in search of explosive devices

The minimum list of equipment required to survey an airplane for an explosive device includes: an explosion suit with a manipulator – 1 unit; bulletproof vest 4th – level 6 protection – 2-3 units; protective helmet level of protection is not lower than "Sphere" – for each specialist; radio interference generator – 1 unit; Steel stiff hook (preferably a tee) – 1-2 units; Strong non-elastic rope with a length of not less than 100 m – 3 units; strong 100-meter long rope with "cat" – 1 unit; screwdriver – 1 unit; mold ribbon (tape); inspection mirror – 2-3 units. or a set of viewing mirrors – 2-3 sets; flashlight – for each specialist; a card of hard paper or plastic in the size of approximately 10x5 cm - 2 units; Optical means of approaching an image (a binocular, a video camera, etc.); hydrogama – 1 hour; electrodetonator – 2-3 units; detonating cord – 5-6 m; sapper wire – 100 m; blasting machine – 1 unit [8].

The most promising and safe use is the use of a special remote-controlled device (work) during the inspection of the aircraft, which must be equipped with appropriate equipment to look for and dispose of an explosive device.

What do robotic systems need?

In the first place, in order to provide personal security guarantees to the personnel of the explosive units from unauthorized explosions during the execution of work to dispose of explosive.

Secondly, robotic complexes can remotely carry out operations for penetration into the premises, transportation of explosive items.

Finally, the study of an explosive device before its destruction or destruction, in order to establish the structure and mechanism of commissioning.

To date, the leading countries manufacturing robot-technical systems for work with explosive devices are the United States of America, Great Britain, Germany, Canada, Japan and others. Works made in these countries consist of one or more mobile robots, a set of variable work equipment, delivery facilities, power supply and maintenance.

Universal mobile works are small-sized remotely controlled self-propelled vehicles equipped with the necessary set of equipment and alternating working equipment. The vehicle consists of a chassis, a body and a power plant. The case can be made of aluminum alloys or alloyed steel. The running gear may be wheel, crawler, variable or combined (Fig.4-5) [5].

The robot management complex includes: the information management part, the post of the mobile robot operator and a set of receiving and transmitting equipment that provides the transfer of information from the robot to the post of the operator and the teams that control the operator's post on the mobile robot.

Remote control of the machine can be carried out from the control station by cable at a distance of 100-150 meters, through the fiber optic communication line - at a distance of 300 meters, by radio - at a distance of up to 1000 meters. The choice of the communication channel option is determined depending on the operational environment and the type of equipment used. It is also possible to connect with works on Wi-Fi channels and Bluetooth.

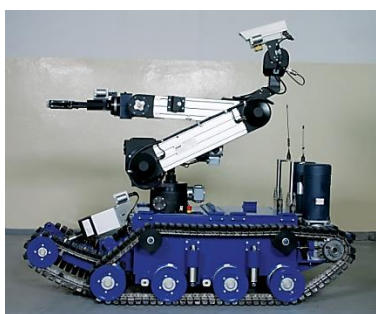


Fig. 4. Robotic remotely controlled complex on a crawler ride



Fig. 5. Robotic remote-controlled complex on a wheelbase

When performing technological operations, the operator, using information about the object and the progress of the work, obtained from cameras and displayed on the screens monitors, continuously manages manually by the executive mechanisms of the manipulator and vehicle.

To date, artificial intelligence [7] and robotics are closely linked to one another. One of the important directions of artificial intelligence is the purposeful behavior of robots, the creation of intellectual robots capable of autonomously carrying out operations to fulfill the objectives of the goals set by man. Operations that can perform work equipped with artificial intelligence is first of all: the definition of the system of the executive mechanism of actuating an explosive device (time, mobile phone, radio signal) with the subsequent blocking of the operation of the explosive device, using special equipment; in the presence of a gas analyzer, the type and type of explosives used; using portable X-ray installations, install a system for actuating an explosive device, provide possible variants for the disposal of an explosive device and determine the zone of possible damage.

Conclusions. The introduction of new technologies, namely artificial intelligence, with the use of robots-sappers will facilitate the conduct of reviews and shorten the time to decide on further actions with the detected explosive device.

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