СТРУЧНИ РАДОВИ
ПРОФЕССИОНАЛЬНЫЕ СТАТЬИ
PROFESSIONAL PAPERS

MODERN ASSETS IN SECURITY SCREENING AND COUNTER TERRORISM

Predrag M. Kojadinović

Serbian Armed Forces, Military Police Department, Military Police Training Center, Department of Forensic - Technical Affairs, Belgrade, Republic of Serbia,
e-mail: kojabk@hotmail.com,
ORCID iD: http://orcid.org/0000-0001-9166-6008

DOI: 10.5937/vojtehg67-19863; https://doi.org/10.5937/vojtehg67-19863

FIELD: Weapons and Military Equipment
ARTICLE TYPE: Professional Paper
ARTICLE LANGUAGE: English

Summary:

The article first briefly discusses hazardous materials, namely their concept and classification. One part of the article is focused on the detection of hazardous materials and the detection of fuzes and initial components of explosive devices. In addition, it presents some of modern counter-terrorist and security screening devices used in Serbia as well as in foreign countries, based on the data collected during a visit to the counter terrorist units of the Serbian Army and the Ministry of Interior of the Republic of Serbia. The aim of the paper is to contribute to gaining an insight into the acquired knowledge of security and protection equipment, detection devices and hazardous materials in particular. The knowledge gained by analyzing and comparing available literature and previous research is expected to lead to raising awareness of the importance of usage of modern equipment which must keep pace with means used by terrorists and commandos in their attacks.

Keywords: counter- diversion protection, hazardous materials, detection of hazardous materials, detection of fuzes - inital components of explosive devices, detection devices.

Introduction

Global changes in the late 20th and early 21st century contributed to an increasing threat of terrorism, organized crime and other security challenges, risks and threats, not only at national but also at international and even global security levels. Perhaps the greatest danger in this

respect is terrorism which requires security operators that confront it with all available forces and means.

An important element to combat both terrorism and commando operations is certainly counter-diversion protection. Counter-diversion protection is a technical discipline that basically involves finding, neutralization, transportation, deactivation and destruction of all types of explosive devices. Making all this possible to perform requires some technical assets for detection of the aforementioned devices with dangerous substances in their structure.

The use of hazardous materials in sabotage and terrorist activities

If we look back, we can see that the choice of the means to attack the target was following the development of science and technology and it developed in several historical phases: knife-poison, gun, dynamite, and, finally, bomb or explosive device. Nowadays terrorists primarily use technological achievements in the manufacture of improvised explosive devices in order to achieve their goals. By using hazardous materials, terrorists can disable or kill a large number of people either in the civilian or military sector, and cause panic and fear thus undermining the security of the state.

It is obvious that hazardous materials are closely related to sabotage - terrorist activities. There is almost no sabotage or terrorist action without some of hazardous materials. But what are hazardous materials?

According to the Law on Safety and Health at Work, hazardous materials are explosive, flammable, oxidizing, poisonous, repulsive, contagious, corrosive, carcinogenic and radioactive substances, established by standards and other law regulations, produced, used or stored in the work process, and also materials that have such characteristic, when attached to a certain substance are dangerous to life and health of employees (Službeni glasnik RS, 101/2005), (Službeni glasnik RS, 91/2015).

According to another definition, hazardous materials include chemical compounds, mixtures of chemical compounds or chemical elements which have a dangerous (harmful) characteristic such as explosion, flammability, radioactivity, or other toxicity (Poštić et al, 1998). Hazardous materials can be classified on the basis of different criteria, but based on the hazardous effects manifested, they are divided into the following four groups:

- explosive,

- flammable substances,
- radioactive substances, and
- toxic materials.

By studying the characteristics of hazardous materials, it is easy to conclude that they are all very suitable for use in sabotage - terrorist purposes for which we have a lot of evidence in current events in the world. There is a real risk that protagonists of international terrorism in the future will use nuclear, biological, chemical agents more and more, and those most widely used will be dangerous substances of high toxicity, high volatility, simple to use, and difficult to detect (industrial substances, toxic chemical substances, etc.). Hazardous materials are easily available on the market and they can be easily synthesized using information from the Internet, which makes terrorists' job much easier.

It is clear that their use is detrimental to people and material and technical resources, so the knowledge about them and modern equipment for their timely detection are the basic preconditions for the prevention of such scenarios and fight against them in case they occur.

Devices for the detection of hazardous materials and fuzes - initial components of devices

When analyzing sabotage and terrorist activities today, it can be concluded that special attention must be paid to preventive measures. Consequently, anti-terrorist measures and actions are imposed as necessary preventive actions, or actions that prevent the execution of terrorist attacks using hazardous materials and their harmful consequences for the safety of people and property. Also, modern methods are applied as well as technical developments which detect terrorists with their materials and resources used to achieve their goals. From this stems the importance and role of modern assets of detection in counterdiverson protection.

Detection is closely related to security screening. Various detection devices are used for that purpose. These devices can be divided into:

- devices for the detection of hazardous materials, and
- devices for detection of fuzes - initial components of devices.

Devices for the detection of hazardous materials can be classified as follows:

- devices for explosives detection,
- devices for the detection of flammable substances,

- devices for the detection of radioactive substances, and
- devices for the detection of toxic substances.

The following devices are used for detecting fuzes - initial components:
- metal detectors,
- X-ray apparatus, and
- stethoscopes.

Each of these devices uses certain methods of work, which will not be discussed in detail on this occasion. We will try to show here some of the advanced representatives of each of the mentioned groups of devices.

Explosives detection devices

When it comes to devices for explosives detection, contemporary devices are able to simultaneously detect explosives and narcotics. All these devices are reliable, fast, flexible, and safe to handle. Some of the leading companies in this field are American FLIR Systems (Forward Looking Infrared), Syagen Technology Inc, SEDET (Sociedad Europea de Deteccion S.L.) in Europe LDS (Laser-Detect system) in Israel, etc.

One of the representatives is a handheld explosives detector E3500 Chemilux. This is a handheld device which works on the principle of chemiluminescence and its purpose is detection of explosives. It is one of the first such devices in the world (Figure 1). It detects military, industrial, and even hand-made explosives, liquid, powder, plastic, nitrate, black powder, and more. It has a dual mode of particles and vapor, and is characterized by a very fast detection (up to 16 seconds) and accurate detection results. The device detects particles and vapors of explosives in a non-invasive way in luggage, letters, vehicles, clothing, electronic devices, documents, etc. It is resistant to various weather and soil conditions, simple to use (one button), with an LCD display with status messages, red and green LED lights, and optional headphones for the audio signal. Data from the device can be forwarded via Wi-Fi. It is powered by a 12V battery whose life is about 6 hours. It weighs about 2.7 kg. No isotopes, radioactive sources, and no license are required. It is suitable for police and military units, customs, ports, airports, bus and railway stations, nuclear facilities, embassies, etc. (Autoclear, 2013)

Figure 1 – E3500 Chemilux
Рис. 1 – E3500 Chemilux
Слика 1 – E3500 Chemilux

The Fido NXT is a hand-held wand which uses the method of molecular spectroscopy, and the principle on which it works is amplifying fluorescent polymers (AFP - amplifying fluorescent polymers). The sensor is made of a capillary glass tube whose interior is covered with a polymer film. It is a product of the famous company FLIR Systems, Inc (Figure 2). Its dimensions are 368.3 x 114.3 x 69.9 mm, and it weighs only 1.4 kg. A lithium battery used to provide power ensures the autonomy of 8 hours. It has a USB port and the MS Office operating system for storing data. It can operate at temperatures ranging from -10 ° to + 55 ° C.

It detects TNT (trinitrotoluene), DNT (dinitrotoulen), Semtex, C4, RDX (Research Department explosive or Royal Demolition explosive or simply hexogen), PETN (pentaerythritol tetranitrate), powder explosive, some industrial explosives, improvised materials, but not peroxides. The start-up time is about 5 minutes and the detection time about 10 seconds. (Laurus systems, 2019)

Figure 2 – Fido® NXT
Рис. 2 – Fido® NXT
Слика 2 – Fido® NXT

Devices for the detection of flammable substances

When it comes to flammable materials, it should be noted that combustible gases and vapors are particularly dangerous. Any type of gas or vapor reacts explosively under certain temperature and pressure determined by the lower explosive limit (LEL) and the upper explosive limit (UEL). Risks are reduced by a permanent control of these limits. There are two types of devices for the detection of flammable vapors, gases and particles, those that detect a specific gas and those that detect several gases. Explosive/flammable ones are hydrogen (H2), a natural gas/methane (CH4 propane - butane, isopropyl alcohol, hexane (C6H14), octane fuel, acetylene (C2H2), ethylene (C2H4), ammonia (NH3), butanone, ethanol (C2H5OH), methanol (CH3OH), toluene, pentane (C6H12), ethylene - oxide (C2H40), (Spectra, 2019). One of the newest representatives of devices for the detection of these substances is a PS200 Series from the Gas Measurement Instruments Ltd company. This sturdy and accurate portable gas detector provides unparalelled protection in the closed space with the audio and visual alarm in case of exposure to gases or combustible substances. It detects up to 4 types of gases simultaneously. It can be configured to detect methane, oxygen, carbon monoxide, hydrogen sulfide, and other flammable gases (Figure 3).

Figure 3 – Combustible gas detector PS200 Series
Рис. 3 – Газоанализатор горючих газов PS200 серия
Слика 3 – Детектор запаљивих гасова PS200 Series

Optionally, it can use an internal pump. Its dimensions are 121 mm x 59 mm x 32 mm and it weighs 230 grams with a pump or 215 without it. A lithium battery allows an autonomy of about 8 hours with the

pump. Charging takes about 4 hours. The operating temperature range is -20 °C to + 50 °C and it withstands falls from a height of 3 meters. Its measurement range is:

LEL	0 – 100%
O_2	0 – 25%
CO	0 – 1000ppm
H_2S	0 – 100ppm

In the case of the aforementioned gases, there is a sound, light and vibration alarm (GMI, 2019).

Apparatus for the detection of radiation

The operation of the majority of radiation detectors is based on a ionization chamber. The radiological detector RadSeeker is a handheld, portable, rugged and highly accurate detector and an identifier of radioisotopes detected by gamma and neutron radiation. Easy to use, it provides fast, simple, and specific information for risk assessment. It is suitable for customs control, border protection, emergency response, and radiological control of objects and persons (Figure 4).

The detector can be used for searching or "screening" to detect radioactive sources, and then to clearly identify whether the detected radioactive material is harmless natural radiation or a more dangerous source, such as special nuclear materials or those contained in 'dirty bombs'. For each source identified, the detector provides risk assessment and describes the source as harmless or as a threat, so that there is no need for the operator to guess.

Figure 4 – Radiological detector RadSeeker
Рис. 4 – Радиологической детектор RadSeeker
Слика 4 – Радиолошки детектор RadSeeker

The built-in wireless capabilities, including Wi-Fi and satellite telephone interface, give those in the remote command center an easy access to information such as identified threats and the location of the device/operator.

In situations when it is considered unsafe to send an operator to the location, the detector can be set mechanically, and monitoring and device control can be performed from a safe distance. It is equipped with three types of alarms (visual, light and vibration) as well as with a GPS (Smiths detection, 2019a). The technical characteristics of the device are given in Table 1.

Table 1 – Technical features of the RadSeeker
Таблица 1 – Технические характеристики RadSeeker
Табела 1 – Техничке карактеристике уређаја RadSeeker

Measuring range counter	25 keV – 3 MeV (Gamma)
Weight	2.4 kg
Power source	Li battery that provides 8h of work
Library	Easily expandable library with 41 radionuclides
Temperature range	from - 32 ^{o}C to +50 ^{o}C
Dimensions	17.8 x 30.5 x 11.4cm

Devices for the detection of toxic substances

The monitor of chemical agents - CAM (Chemical Agent Monitor) is a manual transmission asset, designed for the detection of nerve toxic substances and blister agents in the air (point monitor), for rapid determination of the boundaries of the contaminated area, for detecting contamination of people, ships, planes, motor vehicles, buildings and facilities, for checking the performance of decontamination works, and for monitoring the situation in the objects of collective protection (Figure 5).

The CAM detects nerve and blister agents in the form of vapor in the lowest concentrations that may affect people in a short period. The lowest concentration for nerve agents is G>0.03 mg/m^3 per minute and for V>0.01 mg/m^3 per minute. For blister agents, the lowest concentration is H>0.01 mg/m^3 per minute. It can also detect chlorine, phosgene and hydrogen cyanide (HCN) in the PLUS configuration mode. It contains a beta radiation source of Ni-63 (10 mCi). It works with one battery whose durability depends on temperature (normally 12 hours at a temperature of about 20ºC). The basic features of the monitor are:

- Weight: 1.7 kg,
- Dimensions: length 390 mm, width 80 mm, height 145 mm,
- Power source: LiSO2 battery voltage 6 V,
- Battery life: 45 °C - 18 hours, 20 °C - 14 h, -25 °C - 4.5 h,
- Operating temperature: -25 to 45°C, storage temperature: -55 - to 70°C,
- Suction power of 400 ml/min of air;

It is used in military units, medical units and units of civil protection against terrorist chemical weapons. The manufacturer of the monitor is the Smiths Detection CAMTM from Great Britain. About 30 armies in the world are supplied with CAMs (57000 units), whith about 13 NATO countries which have this monitor as a primary asset. The first CAM was manufactured in the mid 80s. An improved version was produced in 1990 - ICAM (CAM2), and includes the software CAM Plus. The monitor is the primary asset of detection in the “Organization for the Prohibition of Chemical Weapons OPCW". (Privremeno uputstvo za upotrebu CAM, 2014)

Figure 5 – Monitor of chemical agents CAM
Рис. 5 – Газосигнализатор CAM
Слика 5 – Монитор хемијских агенса CAM

Metal detectors

These assets are divided into: devices to screen people, devices for inspection of postal items, and devices for field search. We will show some of the latest representatives of each group.

The Garrett Super Wand is a handheld metal detector of optimal sensitivity. It detects ferrous and nonferrous metals and weapons of non-ferrous metals, and other metal objects (Figure 6). Calibration: digital microprocessor technology eliminates the need for periodic calibration. It

has precise and easy scanning from head to foot. It is easy and convenient to use with one-touch keys and three-color LED lights. The green LED indicates ON (included); the amber LED indicates low battery, and the red LED indicates alarm. The ergonomically designed grip fits comfortably in hand of any size (Garret metal detectors, 2019).

Figure 6 – Handheld metal detector Garrett SuperWand
Рис. 6 – Ручной металлодетектор Garrett SuperWand
Слика 6 – Ручни метал-детектор Garrett SuperWand

The Fisher CW20 is another hand-held metal detector with high performance, able to locate all kinds of metal, and offers the user a choice of three frequencies to eliminate the possibility of any interference. It has the possibility of eliminating interference from steel or reinforced concrete floors (low momentary switch). It is powered by a 9-volt battery and can be set to vibrate or sound when it finds metal. It operates at a frequency of 7.1 kHz (Fisherlab, 2019). (Figure 7)

Figure 7 – Handheld metal detector Fisher CW20
Рис. 7 – Ручной металлодетектор Fisher CW20
Слика 7 – Ручни метал-детектор Fisher CW20

The portable walk-through metal detector Fisher M-SCOPE (Figure 8) provides maximum protection of objects and events in places where there are no static detectors installed. The entire unit weighs only about 38 kg and it can be assembled or disassembled by one person in about 5 minutes. The M-SCOPE has three detection zones with LED indicators which extend from the bottom to the top of the device as well as the signal strength indicator which allows easy assessment of the situation, and a greater flow of persons. By using a simple control interface to the display, the operator can select one of 100 different levels of sensitivity. Rechargeable batteries provide approximately 40 hours of continuous operation. Ruggedized electronics and shock-resistant materials used in the casing guarantee long life even in the most severe working conditions (Fisherlab, 2016).

Figure 8 – Walk-through metal detector Fisher M-SCOPE
Рис. 8 – Рамка-металлодетектор Fisher M-SCOPE
Слика 8 – Металдетекторска врата Fisher M-SCOPE

The security cylindrical metal detector door has shock and bullet-resistant glass and the sides. There is a weight control - a system that allows the passage of only one person. Metal detector sensitivity is set high in the structure. There are possible connections to external peripherals: tags, biometric systems, etc., on request. Entering at an angle of 90 ° is on request. A security door inside the cage can be formed by the door, the floor, the ceiling and side walls, depending on the sensor mass (measuring cell). These special solutions allow the entry of only one person. It automatically checks the inside of the security doors to determine whether, after the metal detector alarm, metal objects have been deliberately left there (Tesla sistemi, 2019). (Figure 9).

Figure 9 – Security metal detector gates with automatic opening
Рис. 9 – Досмотровый металлодетектор, с автоматическим открытием
Слика 9 – Сигурносна металдетекторска врата са аутоматским отварањем

When we talk about inspecting postal items, one of the representatives is the MB1710A device (Letter bomb detector). It is a highly sensitive desktop unit for detecting metal objects in letters or small packages. It weighs 4.5 kg, and power supply and batteries are located in the desktop. There is an alarm for metal detection, both a LED and an audio signal (Vallon, 2012). (Figure 10).

Figure 10 – MB1710A device
Рис. 10 – Устройство MB1710A
Слика 10 – Уређај MB1710A

One of the devices to check the terrain is the VXT1 (All-digital magnetometer for the location of large UXOs at very large depths). It allows the detection on the ground and in water. It has a detachable sensor for underwater detection. It weighs about 13 kg, is powered by a rechargeable battery, and possesses a visual (LED) or an audio signal. It has a long sensor base (about 1.7 m). It is not necessary to adjust the sensor. It has outputs for sending data via RS232 or a USB cable or Bluetooth (Vallon, 2016), Figure 11.

Figure 11 – Metal detector VXT1
Рис. 11 – Металлоискатель VXT1
Слика 11 – Детектор метала VXT1

X-ray devices

Other types of devices which need to be mentioned are x-ray devices, which can be portable and stationary.

The portable X-ray device XRS-4 Golden engineering is a small, lightweight X-ray device that runs on its own batteries. This pulsatile X - beam device produces an X-ray pulse of a very short duration (50 ms). The energy produced is up to 370 KV, which allows penetration through 3.81 cm of steel. Standard equipment consists of two buttons, two battery packs of 18 V, and a battery charger. A remote cable, a carrying case and film processing equipment are also common accessories. The unit weight is about 10 kg (Figure 12). (Golden Engineering, 2018).

Figure 12 – Handheld X-ray device XRS-4
Рис. 12 – Переносной рентгеновский аппарат XRS-4
Слика 12 – Ручни рендген уређај XRS-4

The HI-SCAN 10080 XCT device is a stationary flow device, an EDS (Explosive Detecion system) of the latest generation for high-speed recording of packages and luggage, certified by the US TSA (United States Transportation Security Administration), Figure 13. The device uses X-ray technology and computerized tomography (CT), which represents an ideal solution for processing obtained images. 2D X-ray images (X-ray obtained by the multi-energy ventilation (Figure 14) are completed with 3D CT images, which enables an unprecedented improvement in the detection and identification of forbidden TSA objects (Figure 15). The conveyor belt speed of 0.5 m / s with a scanner tunnel of 1070 mm x 810 mm allow automatic checking of up to 1,800 bags per hour. This represents the fastest ever control system for cargo and luggage (Smiths detection, 2019b).

Figure 13 – Stationary device HI-SCAN 10080 XCT
Рис. 13 – Стационарное устройство HI-SCAN 10080 XCT
Слика 13 – Стационарни уређај HI-SCAN 10080 XCT

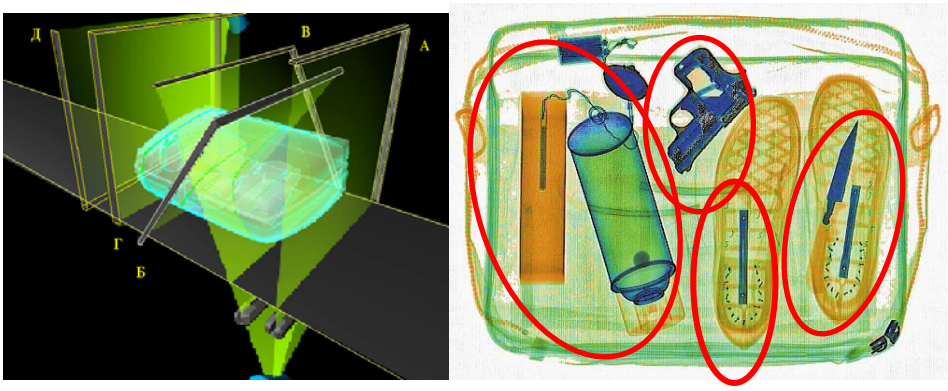

Figure 14 – X-ray multi-energy ventilation through five angles and the images of the detected prohibited items (marked: an improvised explosive device, a gun, a detonator, and a two-part knife)
Рис. 14 – Высокоэнергетическое рентгеновское сканирование под пятью углами и изображение обнаруженных запрещенных предметов (отмечены: самодельное взрывное устройство, пистолет, детонатор и складной нож)
Слика 14 – Рендгентско мултиенергетско прозрачивање кроз пет углова и слика откривених забрањених предмета (обележени: импровозована експлозивна направа, пиштољ, детонатор и дводелни нож)

Figure 15 – 3D CT image and the possibility of its rotation in order to find objects that are not visible from the original angle (labeled: ceramic knife and explosive)
Рис. 15 – 3Д КТ изображение и возможность его поворота с целью нахождения объектов, которые не видны под исходным углом (отмечены: керамический нож и взрывчатка)
Слика 15 – 3D CT слика и могућност њеног ротирања како би се пронашли предмети који нису видљиви из првобитног угла (обележени керамички нож и експлозив)

Stethoscopes

If we talk about modern stethoscopes, it is characteristic that they often have the ability to operate both as contact and contactless devices.

The electronic stethoscope of the Med - Eng Holdings company enables the operator to detect whether the device is armed or located in the liquid condition. It is a sensitive system for monitoring and detecting timing, electronic and mechanical systems which are located within the improvised explosive devices and some unexploded bombs. It contains two types of sensors – a contactless microwave sensor, and a contact handheld audio sensor. The system is extremely easy to use. The equipment includes audio headphones, a small electronic control unit / amplifier (to be worn on the shoulder or a belt), a battery and a charger. Everything is provided in a rugged case, Figure 16 (EOD Technology, 2017).

Figure 16 – Electronic stethoscope Med – Eng
Рис. 16 – Электронный стетоскоп Med – Eng
Слика 16 – Електронски стетоскоп Med – Eng

The electronic stethoscope LIEDS 2220 (Electronic Stethoscope plus Non-Linear Junction Detector) is a very sensitive tool that can detect a very faint sound of mechanical and electronic watches in improvised mines. The crystal detection part is used for the detection of electronic circuits that are typically found in improvised explosive devices, radio transmitters and wireless devices such as mobile phones, various electronic and digital devices (Figure 17). All this can be detected through solid materials such as walls, bricks, glass, plastic, wood, etc.

The control unit is made of aluminum, it weighs around 700 g and has the dimensions of 90 x 42 x 150 mm. The operating temperature range is from -5 to + 70 ° C. The operating frequency range is 10 - 25.000 Hz. It has a very sensitive handset. The device can be connected to a computer (Worldwide technologies, 2007).

Figure 17 – Electronic stethoscope LIEDS 2220
Рис. 17 – Электронный стетоскоп LIEDS 2220
Слика 17 – Електронски стетоскоп LIEDS 2220

The electronic stethoscope BDS-VX (Beijing Defense Stethoscope) has the ability to be used in complex electromagnetic conditions and the conditions of use of interference systems at the same time, and can also detect electronic and mechanic explosive devices under all kinds of covering. Explosive devices include electronic watches, beepers, intercoms, mobile phones and all kinds of telecontroled explosive devices. It can also be used as an antispyware device which can detect covert listening devices and hidden video devices. This device meets the requirements of security of military facilities, airports, stations and ports, as well as the requirements for securing important buildings and police evidence of an explosion.

The device weighs about 900g and its dimensions are 13 × 14.5 × 21cm. The operating temperature range is from -15 to + 45 ° C (Figure 18). It detects mobile phones at a distance of 3 meters or mechanical clocks at 2 meters, and electronic clocks at 0.5 meters (Made-in-China.com, 2019).

Figure 18 – Electronic stethoscope BDS-VX
Рис. 18 – Электронный стетоскоп BDS-VX
Слика 18 – Електронски стетоскоп BDS-VX

Conclusion

Terrorism is the biggest threat to the security of the international community. The methods and means used for such purposes are on higher and higher technical, technological and efficiency levels, and their impact is steadily increasing. Victims are not only individuals, but a much wider circle of people and even states themselves.

In an attempt to locate, neutralize, transport, deactivate and destruct all types of devices used by terrorists and saboteurs, security forces use modern assets. Due to the complexity and sophistication of modern assets used in counter-diverson protection, the key necessity is their understanding and knowledge of their use. We must also take into account technical - technological advances in science and in means used by terrorists and saboteurs to achieve their goals.

In addition to the knowledge and use, it is necessary to constantly monitor the development and procurement of new devices and equipment for detection, identification and neutralization of dangerous devices used by terrorist and saboteurs, in order to effectively counteract modern security challenges, risks and threats.

To be able to successfully oppose to terrorism and other forms of security threats, members of security services need to learn and improve on a daily basis. In that sense, perhaps the best teacher is practice. In their work, members of counter diversion units use experiences from their own practice as well as those from related services in the world, thus improving their performance and efficiency as well as counter-terrorist measures in general.

In a conversation with the members of military police and the Police Brigade counter diversion units, it is possible to hear a number of cases which show the effectiveness of modern assets for detection as well as the skills of their use, but due to the sensitivity of the subject matter, it will not be elaborated further on here.

References

-Autoclear. 2013. Explosives trace detector *E3500 Chemilux*. [online] Available at: http://a-clear.com/wp-content/uploads/2013/07/Scintrex-E3500.pdf. Accessed: 15.04.2019.

-EOD Technology. 2017. *Electronic stethoscope*. [online] Available at: https://www.eod-technology.com/catalog/medeng/electronic-stethoscope/. Accessed: 15.04.2019.

-Fisherlab. 2016. *M-Scope Walk-Through Metal Detector*. [online] Available at: https://www.fisherlab.com/security/manuals/MMSCOPE-R4-2016-reader.pdf. Accessed: 15.04.2019.

-Fisherlab. 2019. *Fisher CW-20 - Hand-Held Concealed Weapons Detector*. [online] Available at: https://fisherlab.com/security/fisher-hand-held-cw-20.htm. Accessed: 15.04.2019.

-Garret metal detectors. 2019. *Garret Super wand Hand-Held Metal Detector*. [online] Available at: https://www.garrett.com/securitysite/pdf/garrett_super_wand.pdf. Accessed: 15.04.2019.

-GMI Gas Measurement Instruments. 2019. *PS200 Series.* [online] Available at: https://www.gmiuk.com/wp-content/uploads/2014/05/64170_05.pdf. Accessed: 15.04.2019.

-Golden Engineering. 2018. *XRS-4 X-ray generator.* [online] Available at: http://www.goldenengineering.com/products/xrs4/. Accessed: 15.04.2019.

-Laurus systems. 2019. *FIDO NXT Explosive Trace Detector*. [online] Available at: http://www.laurussystems.com/products/products_pdf/LS-FLIR-FIDONXT.pdf. Accessed: 15.04.2019.

-Made-in-China.com. 2019. *Electronic Stethoscope (BDS-VX)* [online] Available at: https://beijingdefense.en.made-in-china.com/product/uMbmwpXoEeRc/China-Electronic-Stethoscope-BDS-VX-.html. Accessed: 15.04.2019.

Poštić, P., Tošić, D., Benderić, R., Jovanović, Đ., Đorđević, D., Radovanović, Lj., Milošević, B. & Klikovac, Lj. 1998. *Osnovi protiv – diverzione zaštite*. Belgrade: Institut bezbednosti (in Serbian).

-Privremeno uputstvo za upotrebu CAM. 2014. Kruševac.

-Službeni glasnik RS. 101/2005. *Zakon o bezbednosti i zdravlju na radu.* Belgrade: JP „Službeni glasnik“ (in Serbian).

-Službeni glasnik RS. 91/2015. *Zakon o bezbednosti i zdravlju na radu*. Belgrade: JP „Službeni glasnik“ (in Serbian).

-Smiths detection. 2019a. *RadSeeker Hand-held radioisotope identifier (RIID).* [online] Available at: https://www.smithsdetection.com/products/radseeker/. Accessed: 15.04.2019.

-Smiths detection. 2019b. *HI-SCAN 10080 XCT.* [online] Available at: https://www.smithsdetection.com/products/hi-scan-10080-xct-2/. Accessed: 15.04.2019.

-Spectra. 2019. *Detekcija opasnih gasova.* [online] Available at: https://www.spectra.rs/detekcija-opasnih-gasova/ (in Serbian). Accessed: 15.04.2019

-Tesla sistemi. 2019. *CYL* [online] Available at: http://www.control.co.rs/srpski/metal-detektori/automatska-vrata/cyl (in Serbian) Accessed: 15.04.2019.

-Vallon. 2012. *Letter bomb detector MB1710A.* [online] Available at: http://www.vallon.de/pdf/MB1710A_leaflet_09_2012.pdf?rnd=D4C822D30a22f1BA06PmhuB86E05. Accessed: 15.04.2019.

-Vallon. 2016. *VXT1 Ferrous Locator.* [online] Available at: http://www.vallon.de/pdf/VXT1_Leaflet_EN_2016_09.pdf?rnd=D4C822D30a22f1BC3DijFF2527D9. Accessed: 15.04.2019.

-Worldwide technologies. 2007. *Electronic Stethoscope Plus Non-Linear Junction Detector LIEDS 2220.* [online] Available at: http://www.wtpl.co.in/pdf/explosive.pdf. Accessed: 15.04.2019.

САВРЕМЕННЫЕ СРЕДСТВА ПРОТИВОДИВЕРСИОННОЙ ЗАЩИТЫ

Предраг М. Коядинович

Вооружённые Силы Республики Сербия, Управление военной полиции, Учебный центр военной полициии, Оперативно-техническое отделение, г. Белград, Республика Сербия

РУБРИКА ГРНТИ: 78.25.00 Вооружение и военная техника
ВИД СТАТЬИ: профессиональная статья
ЯЗЫК СТАТЬИ: английский

Резюме:

Во введении данной статьи представлены краткие определения опасных материалов, а также приведена их классификация. Следующая часть статьи посвящена методам обнаружения опасных материалов, взрывчатых веществ и исходных компонентов взрывных устройств. В статье также представлен ряд современных средств противодиверсионной защиты, применяемых как в нашей стране, так и за рубежом. Данные для написания статьи были собраны в ходе обмена информацией во время визитов Контртеррористическим подразделениям Вооруженных сил Республики Сербия и МВД Республики Сербия. Работа написана с целью повышения осведомленности общественности о существующих средствах противодиверсионной защиты, в частности ознакомление с металлодетекторами, а также с иными устройствами и приборами, участвующими в поиске и обнаружении опасных материалов. Надеемся, что знания, полученные в результате анализа и сравнения доступной литературы и предыдущих исследований приведут к повышению осознания и понимания того насколько важно иметь в распоряжении и пользоваться современным оборудованием, которое не должно уступать средствам, которые используют террористы и диверсанты в всвоих атаках.

Ключевые слова: противодиверсионная защита, опасные материалы, обнаружение опасных материалов, взрывчатых веществ и исходных компонентов взрывных устройств, детекторы.

САВРЕМЕНА СРЕДСТВА У ПРОТИВДИВЕРЗИОНОЈ ЗАШТИТИ

Предраг М. Којадиновић

Војска Србије, Управа Војне полиције, Центар за обуку кадрова Војне полиције, Одсек за криминалистичко-техничке и оперативне послове, Београд, Република Србија

ОБЛАСТ: наоружање и војна опрема
ВРСТА ЧЛАНКА: стручни рад
ЈЕЗИК ЧЛАНКА: енглески

Сажетак:

У раду се укратко описују опасне материје, наводи се њихов појам и класификација и говори о детекцији опасних материја и детекцији упаљачко-иницијалног дела направа. Представљена су и нека од савремених средства која се користе у противдиверзионој заштити код нас, али и у свету, а на основу података који су сакупљени у оквиру посета противдиверзионим јединицама Војске Србије и МУП-а Републике Србије. Циљ овог рада јесте да допринесе стицању увида у досадашња сазнања о средствима противдиверзионе заштите, са тежиштем на средствима за детекцију, али и опасним материјама, чије је откривање задатак средстава за детекцију. Сазнања стечена анализом доступне литературе и досадашњих истраживања, као и њиховим међусобним поређењем, иницираће потребу за познавањем и коришћењем савремене опреме, која мора ићи у корак са средствима која терористи и диверзанти користе у свом деловању, а ради остваривања зацртаних циљева.

Кључне речи: противдиверзиона заштита, опасне материје, детекција опасних материја, детекција упаљачко-иницијалног дела направа, уређаји за детекцију.

Paper received on / Дата получения работы / Датум пријема чланка: 11.12.2019.
Manuscript corrections submitted on / Дата получения исправленной версии работы / Датум достављања исправки рукописа: 15.04.2019.
Paper accepted for publishing on / Дата окончательного согласования работы / Датум коначног прихватања чланка за објављивање: 17.04.2019.

© 2019 The Author. Published by Vojnotehnički glasnik / Military Technical Courier (www.vtg.mod.gov.rs, втг.мо.упр.срб). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/3.0/rs/).

© 2019 Автор. Опубликовано в «Военно-технический вестник / Vojnotehnički glasnik / Military Technical Courier» (www.vtg.mod.gov.rs, втг.мо.упр.срб). Данная статья в открытом доступе и распространяется в соответствии с лицензией «Creative Commons» (http://creativecommons.org/licenses/by/3.0/rs/).

© 2019 Аутор. Објавио Војнотехнички гласник / Vojnotehnički glasnik / Military Technical Courier (www.vtg.mod.gov.rs, втг.мо.упр.срб). Ово је чланак отвореног приступа и дистрибуира се у складу са Creative Commons licencom (http://creativecommons.org/licenses/by/3.0/rs/).