

**МЕЃУНАРОДЕН  
ГОДИШНИК**

**НА ФАКУЛТЕТОТ ЗА БЕЗБЕДНОСТ**

**2023/1**

**INTERNATIONAL  
YEARBOOK**

**FACULTY OF SECURITY**

**2023/1**

**Publisher:** Faculty of Security – Skopje

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## **Editorial Notes**

The scientific and professional papers that we publish in the dual of the International Yearbook of the Faculty of Security - Skopje, where the authors present their scientific and professional analyzes and findings from several scientific fields through their papers, namely: criminology , criminological, criminal-legal, police and other scientific fields that have their connection with security sciences and make a certain contribution to the development of scientific thought and a unique contribution to the development of criminal and police practice, which is of exceptional importance for practitioners and the application of science in practice with the aim of more successful performance of police and criminal activity in solving the complex problems we face in this dynamic time of new and serious security challenges.

I express my gratitude to the authors from the Faculty of Security in Skopje, fellow professors and doctoral students of our faculty, but also to the authors from other faculties at the University "St. Kliment Ohridski" - Bitola, authors from other Universities who, through their papers, bring us their theoretical studies and research results from the respective fields related to security and dealing with security challenges.

In the double issue of the International Yearbook for 2023, 9 (nine) papers are published, which cover topics from several security areas, which I hope will provoke your attention to read, analyze and apply accordingly in your scientific studies and research in part from their research results and theoretical analyzes of the respective problems.

I express my pleasure that with the publication of the double issue of the International Yearbook continuously since 2005. the renewed tradition of publishing this international scientific journal at the Faculty of Security in Skopje is continuing.

Sincerely,

Editor of the International Yearbook of the  
Faculty of security

Professor Svetlana Nikoloska



# **PROTECTION AND RESCUE OF POPULATION FROM EXPLOSIVE (UNEXPLODED ORDNANCE AND IMPROVISED EXPLOSIVE DEVICES) IN THE REPUBLIC OF NORTH MACEDONIA**

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## **Abstract**

The system of civil protection and rescue in the Republic of North Macedonia after the breakup of Yugoslavia and its independence in 1991 continued to function as in the previous time, and in 2005 it experienced a complete transformation. This system is one of the basic elements of the national security system, both in peacetime and during emergencies and war.

The protection and rescue system contains a dimension of assistance and protection from a past event, or an event that is ongoing, but at the same time has a preventive dimension. It can be seen through the preparation of a unique risk and threat assessment for the country from natural disasters and dangers. Also, it can be seen through the observation, detection, monitoring and study of possible dangers of natural disasters and other accidents, and further, through training, coaching, exercises, organizing and managing the forces and undertaking protective measures.

**Keywords:** explosives, ordnances, civil protection

## **1. STRATEGIC FRAMEWORK FOR THE CIVIL PROTECTION AND RESCUE IN THE REPUBLIC OF NORTH MACEDONIA**

In an organizational sense, all people, as well as legal entities, are obliged to contribute to the protection and rescue system, except for the elderly, children, pregnant women and other vulnerable categories of persons. Also, this includes the state with all capacities, other state bodies, the local self-government/municipalities, public enterprises, institutions and services, trade companies, etc. Within the protection and rescue system, important legal acts and relevant documents of exceptional importance for the security are adopted. Their overview is shown in table 1.

**Table 1.** Strategic and operational documents related to the national protection and rescue system

<b>SIGNIFICANCE</b>	<b>TITLE</b>	<b>PREPARED BY</b>	<b>ADOPTED BY</b>
Strategic document	National Strategy for Protection and Rescue	Protection and Rescue Directorate	The Assembly upon the Government proposal.
Strategic document	National Assessment of Natural Disasters and Other Accidents	Protection and Rescue Directorate	The Government
Strategic document	National Annual Protection and Rescue Programme	Protection and Rescue Directorate	The Government
Strategic document of local importance	Local Assessment of the Risk of Natural Disasters and Other Accidents	The mayor	Community Council
Strategic document of local importance	Local Annual Programme for Protection and Rescue	The mayor	Community Council
Case application, Specific subject	Protection and Rescue Plan	The plan is mandatory for all participants in the protection and rescue system	PRD controls them
Case application, Specific subject	Study for Protection Against Fires, Explosions and Dangerous Substances	It is a plan for a concrete facility, i.e., installation	PRD controls them

## 2. EXPLOSIVES AND ORDNANCES AS A THREAT

Before explaining and analysing the threat of explosive devices in the Republic of North Macedonia, and how the EOD operations work, for better understating, it is important to note that the territory of the Republic of North Macedonia, as part of the wider region, is an area where numerous unexploded ordnances are still present. This is due to the fact that Balkan wars took place on this territory, followed by the two world wars and the armed conflict of 2001. That is why a huge quantity of ordnance, weapons and arms can be found on this territory.



According to the Government's Assessment of the Threats to the Republic of Macedonia from Natural and Other Disasters ("Official Gazette of the Republic of Macedonia" no. 117/07), the number and quantity of unexploded ordnance and other explosives can be difficult to predict and determine, but given the fact that 5-10% due to various reasons are not activated, it is assumed that on the territory of the Republic of North Macedonia there is a presence of huge amounts of UXOs. Most of them date back to the First and Second World War, as a result of the military actions which took place during that period. Based on the field searches that have been planned, prepared and conducted by the Protection and Rescue Directorate, we can conclude that UXOs are present on the entire territory of the Republic of North Macedonia, but specific areas in which there is the highest concentration of UXOs are:

- Bitola area;
- Prilep-Mariovo area;
- Dojran-Gevgelija area;
- Ohrid-Debar area;
- other areas within the Thessaloniki Front and other armed conflicts on the territory of the Republic of North Macedonia.

According to the assessment, the presence of UXOs is noted in the waters of Lake Ohrid and for their detection and destruction, it is necessary to undertake special measures and procedures.

In the Republic of North Macedonia, on average, unexploded ordnance is found every day, which is not the case in other Balkan countries. Only by 2007, over 200,000 pieces of different types, calibre, explosive charges, purposes and origin were found and destroyed. In addition to these statistics, we should mention the biggest action that lasted for a month (during November 2020), in which pyrotechnicians from PRD removed 12,300 artillery shells 75 mm from the First World War with 7,5 tons of explosives from a site near the centre of Bitola town, which is the largest arsenal of grenades found so far on the territory of the country<sup>1</sup>. The unexploded ordnance was temporarily stored in a warehouse in the old barracks in Bitola, and from December 15 their destruction at the Krivolak Army site began. This shows the necessity that extensive action is needed to detect the remaining unexploded ordnance on the line where the Macedonian front passed in the First World War.

The situation is getting worse when there are wildfires in certain regions where UXOs are present. For example, during the big wildfire in the Dojran region a few years ago, the firefighting aircrafts did not fly there because there were a lot of UXOs in the area. After the extinction, the pyrotechnicians visually counted about 470 pieces, which were then destroyed. Some were very close to the houses.

According to the number of inhabitants and area, Macedonia is the most polluted with unexploded explosives<sup>2</sup> because it was on the main line of the

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<sup>1</sup> Setaliste (02.12.2020). The action for removing the grenades at the stadium in Bitola, over 12,000 pieces, is coming to an end. Retrieved from <https://setaliste.com.mk/vesti/binfo/zavrshuva-akcijata-za-otstranuvanje-na/> [accessed on 05.11.2021]

<sup>2</sup> Kostov, O. (06.06.2022). In five years, there will be only one deminer left, we work illegally, and we do not return from the field without 10 grenades, says pyrotechnician Eftim Mitrov. Retrieved from <https://www.fakulteti.mk/news/06062022/za-pet-godini-kje-ostane-samo-eden-deminer-rabotime->

Thessaloniki front from the First World War, which was 110 km long and 10 km wide. They are mostly in Gevgelija, Dojran, Bogdanci, Bitola, Resen, Ohrid. Recently, unexploded assets have been found around Tetovo, Kumanovo and Skopje, and they date from the conflict in 2001.

About 90% of the UXOs found by the PRD are from the First World War, 7-8% are from the Second, and 2% are from 2001. 90% of the UXOs are functional and can be activated at any time, making them potential killers. A variety of assets have been found, from anti-tank mines, hand grenades, anti-personnel mines, and artillery shells to three World War II aircraft bombs.

Any device fired from a barrel may not be moved from the site or transported. The basic rule is "destroy any ordnance that has come out of the tube directly on the spot". 10 years ago, the PRD removed about 30 tons of grenades from Lake Ohrid, and they still have them. It all depends on what the ordnance is and what kind of lighter it is, mechanical or chemical. They are risky even if they are underwater. In Dojran Lake there are ordnances that were thrown from an airplane. The ones they took out were in excellent condition and still had the paint and inscriptions from 90 years ago.

As a result of non-compliance with the standard procedures, i.e., inappropriate acting in finding the UXOs, certain consequences were caused, whereby a total of 1,083 people suffered, of which, 40 people died by 2007. In the last 10 years, 1 civilian died, 3 civilians and 3 EOD technicians from PRD were injured in accidents caused by explosive devices.

The Republic of North Macedonia is a signatory to the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, typically referred to as the "Ottawa Convention" or "Mine Ban Treaty" and has thus accepted all obligations under its provisions. In addition to the Ottawa Convention and additional protocols, the Republic of North Macedonia has accepted other international regulations that regulate the issue of banning or restricting the use of mines and other explosive devices, according to which it is obliged to implement those measures and activities for the protection of the population and material goods. In that context, it should be emphasized that the Republic of North Macedonia fully complies with those international regulations and is a country that does not have and does not use anti-personnel mines.

In addition to this, for illustration, after finishing the armed conflict of 2001, with the signing of the Ohrid Framework Agreement on 13<sup>th</sup> August 2001, NATO officially launched Operation Essential Harvest<sup>3</sup> on 22<sup>nd</sup> August 2001 and effectively started operations on 27<sup>th</sup> August 2001. The 30-day mission aimed to disarm ethnic Albanian insurgents on a voluntary basis, by collecting and destroying the weapons handed over. Approximately 3,500 NATO troops from 13 countries in a multinational brigade under the command of the United Kingdom, which itself contributed more than 1,700 soldiers, with logistical support, were sent to the country. Nearly 4,000 weapons and several hundred thousand more items, including mines and explosives, were collected.

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[npropisno-a-od-teren-ne-se-vrakjame-bez-10-granati-veli-pirotehnicarot-eftim-mitrov](#) [accessed on 11.07.2022]

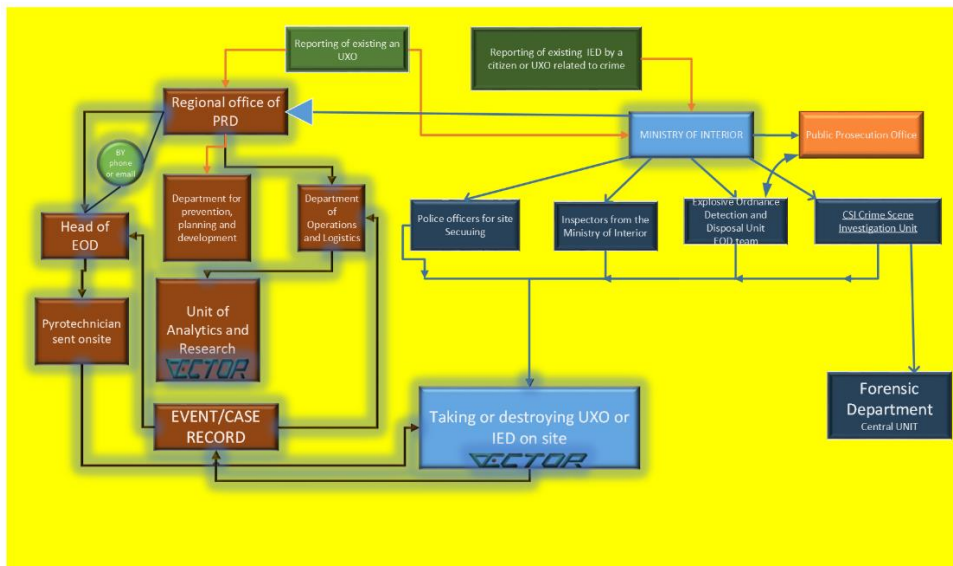
<sup>3</sup> Peace Support Operations in North Macedonia (2001-2003), last updated: 19 May 2022, [https://www.nato.int/cps/en/natohq/topics\\_52121.htm](https://www.nato.int/cps/en/natohq/topics_52121.htm)

In the Republic of North Macedonia, two state institutions are responsible for EOD operations and dealing with explosives and ordnances<sup>4</sup>. The operational flow of these institutions when dealing with explosive devices is shown in figure 1.

The first one is the Protection and Rescue Directorate - PRD which is responsible for conducting the measure of protection against unexploded and other types of explosive ordnances performed by EOD technicians – pyrotechnicians. According to the legislation (Law on Protection and Rescue and the relevant by-laws), the measures include:

- field search and retrieval;
- finding unexploded ordnance;
- marking and securing the terrain;
- disabling and destroying all types of unexploded ordnance and other explosive devices;
- transport to the designated and arranged place of destruction and
- safety measures during transport.

The second institution responsible for EOD operations is the Ministry of Interior, which is responsible for deactivation of improvised explosive devices and undertaking appropriate preventive measures for protection of the population. If an improvised explosive device is found somewhere and reported to the Police, then the EOD experts from the Sector for Countering Terrorism, Violent Extremism and Radicalism are authorized to act. They are performing certain activities for documenting the case (such as taking photographs as evidence for the needs of criminal investigations) and are taking measures and activities to deactivate and destruct the device.



**Figure 1: PRD and MoI Operational Flow**

<sup>4</sup> More on the challenges in their work see Babanoski, K., Malish Szadovska, M., Ivanov, A., Protection and Rescue of Population from Unexploded Ordnance (UXO) – Challenges with the Current Procedures Through Capacity Gap Analysis, International Yearbook, Faculty of Security, Skopje, 2021/2, <https://fb.uklo.edu.mk/wp-content/uploads/sites/10/2022/02/GODISNIK-2021-2-konecen.pdf>

Unexploded ordnance disposal teams of the Army of the Republic of North Macedonia are also responsible for dealing with UXO in certain cases. They are responsible for the destruction of spent ammunition and mine explosives and unexploded ordnance on the ranges and training grounds used by the Army. They also provide assistance to the MoI and PRD in the process of destroying the UXOs according to a previously concluded memorandum, i.e., agreement between the institutions. Members of these teams participate in joint training activities together with other pyrotechnicians from other institutions. The members of the teams, trained according to NATO standards, are trained in field search with minesweepers, transcompletion of explosives, and destruction by high and low-order detonation methods. They are solidly equipped with professional and educated staff, protective equipment and tools. International networking enabled them to exchange experiences and knowledge and incorporate good practices from other countries.

In case of evasion of some ammunition during shooting at the Army ranges, it becomes UXO. The shooting leader submits an EOD incident report via classified information network to the EOD team leader. The following information is stated in the report: type of UXO, location, model of the asset, etc. The EOD team leader prepares an engagement document in which specifies an EOD team of at least two people to conduct the destruction, and necessary equipment (a number of explosives, detonator capsules, slow-burning fuse, disruptor, cumulative charge and others). In doing so, the EOD team leader demands paramedics, a firefighting team and physical security of the operation zone. After the destruction of the UXO, the EOD team prepares a report according to a prescribed form that states: the type of destroyed UXO, model of the asset, a number of consumables and other notes about the activity, and submits the report to the EOD team leader.

The private security entities in the country are also involved in the processes of identification and dealing with UXO. These are the private security agencies in charge of securing factories and other facilities that deal with metal processing, so it sometimes happens that UXO is found during the transportation of secondary raw materials. If any of the employees in charge of securing and inspecting the transport visually notice an UXO, then they report to their supervisors in the agency for further taking appropriate measures and activities. In addition to the administrative-technical bans that can be imposed on the company that brought the secondary raw materials, and with them the UXO, the private security agency takes measures and activities to secure the location (stationary physical security, using technical devices, etc.) and notifies the PRD with appropriate documentation: written submission and photo-documentation, and then the PRD prepares an appropriate record for the case, which further acts accordingly. Some private security agencies<sup>5</sup> have also adopted their own written procedures, such as the Protocol for the mode of access and handling in the detection of UXOs (between the Agency and the legal entity transporter of secondary raw materials) and the Manual for handling explosive and other dangerous means (pocket edition for internal use).

Huge quantities of UXOs are also present in the lakes throughout the country. For example, so far, one action for underwater cleaning of Lake Ohrid was conducted

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<sup>5</sup> Presentation by representatives of the Private Security Agency UNA at Workshop and citizens raising awareness campaign The Danger of the Unexploded Ordnances (UXO): Application of Digital Technologies in the UXO Recovery, 12-14.11.2021, Ohrid, Republic of North Macedonia

in the period 2010-2012<sup>6</sup>. This three-year action<sup>7</sup> was successfully implemented, resulted in 83,140 m<sup>2</sup> of searched, checked, scanned and cleaned area and 6,627 pieces of UXO with a total weight of 19,720 kg were found and removed. There is a need to continue this action in places that are well known to the underwater demining team at the Directorate for Protection and Rescue, not only on the Macedonian side of Lake Ohrid, but also on the Albanian coast, as well as on other natural lakes in the country.

### **3. PROTECTION FROM UNEXPLODED ORDNANCE – LEGAL FRAMEWORK, TASKS AND RESPONSIBILITIES**

The legal framework governing the matter of dealing with EOD operations with unexploded ordnance by the institutions within the protection and rescue system, especially by the Protection and Rescue Directorate includes:

***Strategic documents:***

- Assessment of the Threat to the Republic of Macedonia from Natural and Other Disasters (Official Gazette of the Republic of Macedonia No. 117/07);
- Methodology for the Content and Manner of Hazard Assessment and Protection and Rescue Planning (Official Gazette of the Republic of Macedonia No. 76/06).

***Laws:***

- Law on Protection and Rescue (Official Gazette of the Republic of Macedonia No. 36/04, 49/04, 86/08, 124/10, 18/11, 41/14, 129/15, 71/16 and 106/16, Decision of the Constitutional Court no. 178/08 published in the Official Gazette of the Republic of Macedonia No. 85/09, Authentic Interpretation of the Law on Protection and Rescue published in the Official Gazette of the Republic of Macedonia No. 114/09)

***Government Decrees:***

- Decree on Implementation of the Measure of Protection from Unexploded Ordnance and Other Explosive Devices (Official Gazette of the Republic of Macedonia No. 101/10);
- Decree on Implementation of the Measure of Protection and Rescue from Fires, Explosions and Hazardous Substances (Official Gazette of the Republic of Macedonia No. 100/10).

***Rulebooks:***

- Rulebook on Measures for Protection from Fires, Explosions and Hazardous Substances (Official Gazette of the Republic of Macedonia No. 32/11).

***Guidelines:***

- Guidelines on the Content of the Rulebook on Protection from Fire and Explosion of the State Bodies, State Administration Bodies, Local Self-government Units, Public Enterprises, Public Institutions, Trade Companies,

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<sup>6</sup> Presentation by representatives of the Protection and Rescue Directorate at Workshop and citizens raising awareness campaign *The Danger of the Unexploded Ordnances (UXO): Application of Digital Technologies in the UXO Recovery*, 12-14.11.2021, Ohrid, Republic of North Macedonia

<sup>7</sup> Implemented by ITF Enhancing Human Security from Slovenia and Protection and Rescue Directorate from the Republic of North Macedonia, funded by United States of America - office of Weapons Removal and Abatement in the U.S. Department of State's Bureau of Political-Military Affairs

Sole Proprietors and Other Legal Entities (Official Gazette of the Republic of Macedonia No. 80/11);

- Guidelines for the Content of the Study for Protection from Fires, Explosions and Dangerous Substances (Official Gazette of the Republic of Macedonia No. 139/10).

***Internal acts adopted by the Director of the Protection and Rescue Directorate***

- Standard Operational Procedure for Protection from Unexploded Ordnance and Other Explosive Devices no. 10-1760/1 from 07.05.2010;
- Standard Operational Procedure for Humanitarian Demining, 2010;
- Standard Operational Procedure for Implementation of the Measure of Protection and Rescue from Fires, Explosions, and Dangerous Substances no. 01-2969/2 from 09.11.2010.

The citizens who found unexploded ordnance and other explosive devices at a certain location are obliged to mark the location and immediately notify the Protection and Rescue Directorate, the regional protection and rescue departments or the nearest police station.

After receiving the notification of the discovery of unexploded ordnances and other explosive devices, the Directorate undertakes preventive and operational measures for protection, in accordance with the standard operative procedures for protection from unexploded ordnance and other explosive devices, as well as the standard operative procedure for humanitarian demining. Within these activities, the responsible entities carry out the following activities:

- The Directorate sends a pyrotechnician for inspection and destruction of the found unexploded ordnance and other explosive devices, informs the local community about the devices and the activities undertaken for their destruction and then performs the destruction;
- The Ministry of Interior performs physical security at the place where unexploded ordnance and other explosive devices were found and provides escort with vehicles of the traffic police if they need to be transported to another site for destruction;
- The Ministry of Health, through the public health institutions, provides a medical team for first aid and
- The Ministry of Environment and Physical Planning participates in determining the locations where the unexploded ordnance is to be destroyed.

According to the established operative procedures, the steps taken by the pyrotechnicians after finding UXOs are as follows:

1. Alert/notification for finding UXOs (people, police, etc.);
2. Reporting to the head of the Sector for prevention, planning and development in the PRD;
3. Entering the data in the records for received reports;
4. Inspection of the location for the purpose of reconnaissance, checking the condition and identification of the assets, finding and determining the safest place for destruction - performed by the nearest located pyrotechnician:
  - Determines the necessary steps for access to the found asset;
  - Performs identification;
  - Checks the condition of the asset;
  - Finds the most favourable place for destruction and
  - Compiles report and photo documentation.

5. Filling data in the records of UXOs.

NOTE: If it is impossible to identify the device, photo documentation showing real measurements is sent to the expert team to determine which device is in question and what its technical characteristics are.

The average time between an explosive device being discovered and the arrival of EOD technicians (pyrotechnicians) is between 2 and 4 hours and it depends on several aspects (EOD technicians' availability, transportation, access to the area where UXO is found, etc). The average time it takes to identify the type of explosive device and implement render safe procedures after arrival at the location is up to 15 minutes. This short identification time is due to the long work experience of pyrotechnicians in PRD (about 25 years) and their excellent knowledge of explosive devices. If happens the device is unknown to them, then the identification takes more than 8 hours, in order to make consultations and exchange opinions with their colleagues, so the identification process then takes longer. But so far, they have not discovered such unknown devices for them.

The action plan compiled by the responsible persons in the Directorate for the purpose of searching the field for finding and determining existence of unexploded ordnance and its destruction contains the following attachments:

1. Excerpt from the assessment of the threat to the territory from military actions, natural disasters, and other accidents of importance for this measure;
2. Overview of areas where UXO is expected to be found;
3. Review of specialized units for protection from UXOs;
4. Review of equipment, material and technical means;
5. Review of vehicles that can transport the UXOs;
6. Map of the respective area and
7. other attachments.

In order to perform the tasks and duties in the field of protection and rescue, and in connection with finding and destroying unexploded ordnance, the Directorate may call citizens - pyrotechnicians and support workers who will be hired to search the field to find and determine existence of unexploded ordnance, as well as their destruction.

Depending on the urgency and duration of the marking of suspicious areas, the following types of marking are used:

- **Immediate marking** of suspicious or mined areas is a clear visual warning at a time when a field sketch is created. It is carried out by the general reconnaissance teams, teams for mine warning and other persons. It should be clearly recognizable from 50m and markings should be placed at the access points of the suspicious area. It is performed with local means (crossed pegs, stones) and standard mine signs. Without maintenance it should last up to six months.
- **Semi-permanent marking** is a more permanent visual barrier that is set to provide a clearer line between a safe and a suspicious or mined area. The borders are marked with a standard mine fence. This way of marking, without maintenance, should withstand all atmospheric influences for up to one year.
- **Permanent marking** is carried out where the movement of people and livestock is frequent and where the destruction operation is not planned in the near future. There should be a visual and physical obstacle to the movement of people and animals. This way of marking should retain all atmospheric influences for one to five years.

The most important special equipment and material-technical means for dealing with found unexploded ordnance and other explosive devices are: minesweepers, tentacles, protective helmets, diggers, shovels, axes, pliers, etc. The persons from the EOD team, who

perform the activities and control in the dangerous areas, should constantly, in accordance with the conditions, i.e., according to the assessed dangers, have protective equipment. Each EOD technician and controller should owe the minimum standard personal protective equipment, which includes a face mask, protective helmet and body armour vest. The specific features of the protective equipment are the following:

- face mask - should cover the whole face including the front and side of the face, forehead, and neck. The mask should cover it around the neck or enter it, to have good visibility without hiding and changing the image.
- body armour vest - should protect the front of the upper body including the front and sides, neck, shoulders and upper hips with groin.
- shoes - in order to protect from the conditions in the environment, military boots are used and also, in accordance with the recommendations, boots for protection from explosion are used.
- other work clothes and personal equipment - during the work a single work uniform will be used (work suits and overalls), marked by the organization and the demining team. When cleaning houses, due to the possibility of injury from building materials, helmets should be used.
- metal detector - it should have such characteristics to detect the lighter of the explosive device at a minimum distance of 10 cm. The daily testing of the detector before the start of the work is performed by the team leader with the technicians, and the results are recorded in the daily records of the condition of the detector.
- vegetation removal tool - the tool should have a sharp blade and be suitable for handling (grass scissors or small sickle, bush scissors or fruit tree scissors and a small hand saw).
- excavation shovel - small shovels with a sharp tip are used to excavate located suspicious objects. A suitable knife can be used on this occasion.

Disabling and destroying all types of unexploded ordnance and other explosive devices is carried out at the place of discovery if there are safety conditions. If the safety conditions are not met, the destruction of unexploded ordnance and other explosive devices is carried out at pre-determined and arranged places for that purpose.

The neutralization of the UXOs is a procedure for removing, deactivating, and destroying such found assets, and in a broader sense, technically defective and written-off explosive devices.

There are two ways to neutralize these assets:

- by detonation;
- by burning.

According to all described dangerous activities performed by the pyrotechnicians, it can be concluded that it is a very risky profession. The world nomenclature of dangerous occupations says that the pyrotechnician is in second place because the persons are under daily stress and at maximum risk. To save the citizens, they put their own lives at risk. Each bomb found is a threat to at least one citizen.



#### 4. PROTECTION FROM IMPROVISED EXPLOSIVE DEVICES

Terrorism today is a major threat to nations and the international community. The process of preparing terrorist acts takes a long time and depends on the readiness and finances available to terrorist groups. Secrecy and conspiracy are their main characteristics. Often, the explosives with which they carry out terrorist acts are produced by themselves. The wide range of such deadly improvised explosive devices allows terrorist groups to use them to achieve their goals in a variety of ways. But detecting and deactivating such improvised explosive devices is a challenge for the state institutions. The classic methods of conventional warfare, so far, in practice, in regards to the detection and elimination of modern security threats, including threats from improvised explosive devices, do not give positive results. But modern warfare or modern anti-rebel warfare approaches the exploration of such threats quite systematically. To this end, it is necessary to increase domestic and international engagement and joint response in dealing with such threats, including the advancement of intelligence and analysis and the improvement of the operational planning made by the relevant institutions.

The dealing with improvised explosive devices and the protection from them by the Ministry of Interior is not described in detail in publicly available laws or regulations. Such documents are classified; therefore, they are inaccessible. However, the basics of the improvised explosive device procedure are given in:

- Law on Internal Affairs (Official Gazette of the Republic of Macedonia No. 42/2014, 116/2014, 33/2015, 5/2016, 120/2016, 127/2016, 142/2016, 190/2016, 21/2018 and 135/2018 and Official Gazette of the Republic of North Macedonia No. 108/2019 and 275/2019, Decision of the Constitutional Court of the Republic of Macedonia no. 55/2014 from 27.05.2015, published in the Official Gazette of the Republic of Macedonia No. 96/15)
- Law on Police (Official Gazette of the Republic of Macedonia no. 114/2006, 6/2009, 145/2012, 41/2014, 33/2015, 31/2016, 106/2016, 120/2016, 21/2018 and 64/2018, Decision of the Constitutional Court of the Republic of Macedonia no. 211/2006 from 05.11.2008, published in the Official Gazette of the Republic of Macedonia no. 148/2008)
- Rulebook on the Manner of Performing Police Works (Official Gazette of the Republic of Macedonia No. 149/2007, 110/2011, 117/2014, 14/2017, 49/2017, 203/2018, 275/2019 and 52/2020, Decision of the Constitutional Court of the Republic of Macedonia no. 1/2011 from 08.06.2011, published in the Official Gazette of the Republic of Macedonia No. 86/11).

In the last 10 years, in the Republic of North Macedonia, more than 50 pieces of UXOs were found on the field and more than 300 pieces were found during combat exercises of special police task forces within MoI. Also, MoI was involved in EOD operations for neutralizing around 10 IEDs found in the country.

One death and one injured person are the casualties caused by IEDs in the last 10 years in the country. Thereby, it is not clear if they are the result of non-compliance with the procedures, i.e., inappropriate acting in EOD operations or by negligence or something else. EOD unit is centralized and the headquarter is in the capital of the country.

The average time it takes to identify the type of explosive device and implement render safe procedures depends on the situation, location, and type of the explosive devices.

The first-responders (police officers who will first arrive at the scene, in this case when an unexploded ordnance or improvised explosive device was found), are legally

authorized **only** to take measures and activities to secure the scene (which includes marking the area/scene and restriction of movement through the area) and to perform a visual inspection of the area, object, room, space and objects at the scene. Thus, when they find out about a committed crime, misdemeanour or event due to which direct observation, determination or clarification of the facts should be performed, they are obliged to secure the scene until the arrival of the officials from the competent state body, to examine it for the purpose of detecting and securing traces of a crime and objects that can serve as evidence, finding a perpetrator, as well as collecting notifications related to the crime, misdemeanour or event.

During the inspection of the scene, the police officer acts in a way that prevents the destruction of the traces and prevents the change of the current situation. The police officer collects information about the incident from the persons present at the scene and from the authorized persons who may enter the scene, including other police officers.

The police officer who secures and inspects the scene, upon arrival of authorized persons from a competent state body, gives an oral report on the current situation and other facts relevant for the event, as well as the measures and activities undertaken or any changes of the scene to another police officer authorized to inspect or to a person authorized to undertake further measures and activities.

Experts from the Forensics Department and the Department of Serious and Organized Crime then start to identify, analyse, deactivate and/or destroy and document the devices found, which in some cases have been used for terrorist purposes. In the process of detecting improvised explosive devices, service dog units are involved in a systematic and methodical-research manner, which, with the help of search qualities of dogs, detect such devices.

The first responders, EOD technicians and off-site headquarters/experts when countering explosive devices communicate and coordinate with each other using secure communication devices from a safe distance and appropriate channels and also verbal/face-to-face communication.

Further action, depending on whether an improvised explosive device or unexploded ordnance was found at the scene, is the responsibility of experts from the Sector for Countering Terrorism, Violent Extremism and Radicalism or the pyrotechnicians from the Protection and Rescue Directorate respectively. Within their duties, they document the case by taking photographs as evidence that are included in the photo documentation of that event.

The common operating procedure for countering explosive devices followed by EOD technicians in MoI in practice looks as follows:

- establishing a safe perimeter;
- establishing a command post;
- taking measures for trying to identify the found suspected object (is it explosives device or not);
- discussing and decision making about the method which will be used for neutralizing and dismantle the explosive device (manually or by using a special charges and disrupters from distance);
- taking an action for dismantling the device;
- after the crime scene investigation is completed, EOD teams are picking up the remain parts from device for further analysis as evidence.

EOD technicians from MoI are using appropriate hardware equipment when dealing with UXOs/IEDs in the field which helps them to securely handle the device and deactivate it.

Regarding the more detailed measures and activities undertaken by the police officers, as well as the members of the Anti-Terrorism Sector, within their action, no other documents which more closely regulate this area, such as decrees, rulebooks, standard operational procedures and similar, are publicly available. They have a certain degree of classification which is at least "restricted".

## **5. VECTOR PROJECT-RELATED ACTIVITIES**

Within the VECTOR project, in order to better understand the protection and rescue of the population from explosives, two baseline documents were developed.

The first one is the End User Requirement Report, which presents the results obtained from the implemented MoSCoW method and makes an analysis of the end users' requirements from both institutions: PRD and MoI. It explains and elaborates the end users' functional, operational and security requirements for the VECTOR tool to enhance the safety and efficiency of EOD operations in the field. Questionnaires and interviews took place with Explosive Ordnance Disposal (EOD) units and other relevant experts from the PRD and MoI as part of MoSCoW analysis of end-user requirements. The MoSCoW analysis was conducted based on a preliminary questionnaire to determine specific requirements followed by interviews to confirm and clarify the responses. While developing the questionnaire, conducting the survey, and making the MoSCoW analysis, as well as for coordination purposes, the representatives from the Forensics Department from MoI gave added value to this report. They were engaged in unstructured interviews as part of the co-design process, and they shared their expertise and elaboration of the current process for identifying suspicious objects, as well as a methodology for conducting EOD operations within the MoI with the project team. Also, during the organized meetings with MoI representatives, they contributed to a better understanding of the operating aspects of the tasks and procedures undertaken by MoI within EOD operations. The main findings in the Report are summarized in sets of the end users' requirements that are of the utmost importance for the other project tasks and activities. The assessment of these requirements made by the end users need to ensure that the final VECTOR product directly addresses the operational needs of EOD specialists.

The second document is the Operational Capacity Gap Report. It was done to understand the current situation, operating procedures, limitations, and potential ways to enhance remote EOD operations. Ultimately, its purpose was to identify ways in which VECTOR can contribute to improving the safety and efficiency of EOD operations. The capacity gap analysis was conducted in the early stages of the project, by the consortium in cooperation with the end-users to identify current difficulties in the operational effectiveness that VECTOR will fill. This task ensures that the project clearly maps out and identifies current capacity gaps in the specific end-user communities as well as in the wider NATO scope of UXO and suspicious package response. This will ensure that the VECTOR deliverables will not only enhance existing operational duties but also will be designed to require minimal additional training, system and hardware modification and maintenance. The purpose of the report was to elaborate on how EOD operations work at the moment within the responsibilities of the end-users and to present an analysis of the operational and capacity gaps. It was done by a comprehensive legal framework analysis, as well as the survey (questionnaire and interview) conducted with the end-users' EOD technicians. The findings and results in the report are intentionally divided into two main parts, one for the PRD and one for the MoI, to get a clearer picture of the operational and capacity gaps of

both institutions, which in turn work in similar, but different fields: PRD is responsible for dealing with UXO and MoI is responsible for dealing with IED. Such findings can be used to design a technical solution more effectively.

On 24.12.2020 an online scientific and professional debate was held on the topic "Protection from Unexploded Ordnance - Current Situations and Challenges" with representatives from the institutions of the protection and rescue system that have their role in the recognition and destruction of explosive devices. The main conclusions that were reached are the following:

- amending and supplementing the relevant legislation and implementing the legal solutions in practice, especially the international standard operating procedures and best practices for dealing with unexploded ordnance,
- solving the problem of the lack of human resources, especially in the PRD,
- procurement of appropriate protective equipment for pyrotechnicians,
- strengthening the interdepartmental cooperation between the MoI and PRD, in the area of securing the locations where UXOs were found.

Between 12-14.11.2021 in Ohrid, the Faculty of Security – Skopje organized a workshop and citizens raising awareness campaign entitled *The Danger of the Unexploded Ordnances (UXO): Application of Digital Technologies in the UXO Recovery*. The workshop was conducted in order to determine the achievements within the VECTOR project jointly with the end users (PRD and MoI). During the workshop, the challenges that exist in dealing with unexploded ordnance and improvised explosive devices and the ways in which modern technology can be applied in operations to neutralize them were discussed. End-user representatives, together with the project team, representatives of the Faculty of Security - Skopje and invited experts from other institutions involved in the protection and rescue system discussed the above aspects. A demonstration exercise and presentation of the opportunities offered by the VECTOR application and the achievements within the project helped to evaluate and improve the practical applicability of the VECTOR components. After the workshop, an activity/campaign to raise awareness of the danger of unexploded ordnance among the citizens of Ohrid was carried out.

On 10.12.2021, the conference of scientific and professional significance entitled *Modern Challenges in Discovering Terrorist Threats from Improvised Explosive Devices* happened at the Faculty of Security – Skopje. The purpose of the conference was to share and exchange scientific and expert opinions and views on the detection and recovery of improvised explosive devices (IEDs) used as a means of realizing terrorist threats. The identification, classification and assessment of explosive devices, such as improvised explosive devices and unexploded ordnance, are vital to explosive ordnance disposal operations by the relevant security services and are critical to the strategic interests and tactical operations of NATO and its partners. During the conference, the development and application of solutions (advanced technologies, methodologies and practices) to combat improvised explosive devices in response to terrorism were discussed. It enabled networking and increased communication between professionals and theoreticians working on the research related to dealing with improvised explosive devices. The presentations and discussions made it possible to review the real situation and the challenges they face, identify the gaps and weaknesses and offer solutions to overcome the situation.

The inter-institutional communication, coordination, exchange of experience and the provision of assistance and support are particularly important in dealing with unexploded ordnance and improvised explosive devices. In that direction, the EOD teams of the Army of the Republic of North Macedonia that are solidly staffed with professional and educated

personnel, protective equipment and means of work and well internationally networked, are willing to cooperate, use their expertise and accumulated experience and knowledge in VECTOR project activities and future projects in the field of dealing with unexploded ordnance and improvised explosive devices.

The team of practitioners from different state institutions of the security system and theoreticians from the relevant higher education institutions which is slowly formed through their involvement in various activities in the VECTOR project has excellent interpersonal communication, professional cooperation, exchange of experiences and good practices that should continue to be further developed, and further deepened at the institutional level. The joint appearance of such a team of practitioners in international projects can significantly help to overcome weaknesses, fill in the gaps, and modernize the work and the approach to dealing with unexploded ordnance and/or improvised explosive devices. Modern technologies offer unlimited possibilities for application in everyday work tasks, facilitating access and reducing the risks of dealing with unexploded ordnance and/or improvised explosive devices.

## **6. CONCLUSION**

In the Republic of North Macedonia, there are several competent state institutions in the field of security which are directly responsible for detecting, identifying and dealing with UXOs and IEDs. These are the Protection and Rescue Directorate, the Ministry of Interior and the Ministry of Defense. Measures and activities for the detection and neutralization of these explosives are taken by the police officers – first responders, who secure the scene and the pyrotechnicians. At the same time, it should be noted that these institutions have their own internal procedures on how to safely treat UXOs and IEDs, as evidenced by the numerous successful operations carried out throughout the country.

Based on the research and analysis of the work and competencies of EOD teams, during the VECTOR project implemented activities, it can be concluded that there are certain challenges. Namely, they refer to:

- insufficient number of pyrotechnicians, who still work, although most of them are above the recommended age limit for working on this issue;
- lack of technical means and equipment to effectively deal in the field, such as appropriately armoured vehicles, personal protective equipment, etc.
- need to improve interdepartmental cooperation, implementation of joint trainings and exercise activities, etc.

In order to overcome these situations, and bearing in mind that it is an extremely sensitive activity, we recommend that the situation with human and technical resources in all competent authorities should be improved in the next period.

During the implementation of the joint activities within the VECTOR project, we found that the representatives of the PRD and MoI, as end-users, achieved excellent cooperation, informally networked and laid a solid foundation for interdepartmental cooperation in the next period as well.

Also, with the completion of the project, opportunities will be created for more successful and effective implementation of the measures and activities in the field, which refer to the handling of UXOs and IEDs, through the application of the software tool for explosives recognition.

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# CRIMINALISTIC CHARACTERISTICS OF THE ABUSE OF PAYMENT CARDS IN THE REPUBLIC OF NORTH MACEDONIA

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## Abstract

The abuse of payment cards is a serious crime, a non-violent crime that is mostly committed by the abuse of computer technology and precisely because of this it has the criminal characteristics of computer crime. Criminal actions are aimed at damage and unauthorized access to a computer system and the creation and use of a fake payment card. The macedonian legislator has criminalized crimes with elements of abuse of payment cards systematized in Chapter 23 of Criminal Offenses against property with the crime “Damage and unauthorized access to a computer system” in Article 251 and in the Chapter of Criminal Offenses against public finances, payment transactions and economy is the crime “Making and using a fake payment card” from Article 274 – b”. The subject of analysis in this paper of the criminal characteristics of the abuse of payment cards in the Republic of North Macedonia in terms of the methods and means of execution as well as the connection of the perpetrators in the direction of the appropriate qualification of a specific crime in criminal situations. Through the method of normative analysis, the specific crimes and incriminated criminal behaviors that are characteristic of the criminal phenomenon with elements of misuse of payment cards, the scope and dynamics of the specified crimes for the research period 2020 - 2022 are analyzed and through case analysis, the extraction of criminal characteristics.

**Keywords:** computer crime, fraudulent payment card, criminal act and criminalistics characteristics.

## 1. INTRODUCTION

Computer crime with elements of abuse of payment cards is a reality in the Republic of Macedonia, which results from most of the research done by scientists, but also according to the data contained in the annual reports of the Ministry of Internal Affairs of the Republic of North Macedonia, but also according to the tests carried out by the Electronic Communications Agency and the National Computer Incident Response Center MKD – CIRT. According to a public opinion survey - a field survey of citizen public opinion

regarding cyber security, conducted in 2022, 47 % of the respondents stated security concerns when paying online. These are significant indicators that computer criminal phenomena should be continuously investigated, especially those that cause double harm to citizens, on the one hand concern for their personal data in banking institutions and causing financial damage in the service of misuse of their payment cards.

The Republic of North Macedonia in the Criminal Code does not have a separate Chapter on computer crimes, they are systematized in several Chapters, according to the object of the criminal attack, the method of execution and the means of execution used as important criminalistics characteristics for the classification of a specific crime in a criminal situation. The crime of abuse of payment cards manifests itself through two groups of criminal activity, through unauthorized entry into a computer system and misuse of payment card data in a way that either involves stolen or copied data used in electronic commerce, but also in other payments of bills for received services and crime with more complex activities of securing data from payment cards, producing fake payment cards and using them. All criminal behaviors are related to a single criminal goal of the perpetrators, which is the realization of illegal property benefit, but the abuse of computer data and computer systems are used as a means of criminal attack.

Criminal activities of abuse of payment cards are mainly two groups of manifest forms and that use of data from payment cards provided by previous criminal behavior such as theft of payment card, unauthorized recording of data from payment cards or obtaining data from payment cards with unauthorized entry into the computer system of banking institutions and use of that data and forgery of payment cards.

„Computer system means any device or group of interconnected devices, one or more of which performs automatic data processing according to a specific program. By computer data is meant the presentation of facts, information or concepts in a form suitable for processing through a computer system, including a program eligible for the computer system to put it into operation. (Criminal Code, Official gazete of RM No. 07/08). Electronic money is money that, based on the law, is in circulation in the Republic of Macedonia or in a foreign country. Payment cards are any type of means of payment issued by banking or other financial institutions that contain electronic personal data and electronically generated numbers that enable any type of financial transaction. (Criminal Code; Official gazete of RM No 114/09).

The abuse of payment cards is manifested by criminal activities incriminated in the crimes "Damage and unauthorized access to a computer system" according to Article 251 and "Production and use of a false payment card" according to Article 274 - b. Through the provision, analysis and comparison of data on detected crimes and the analysis of cases from practice, indicators of the criminal characteristics of the specified crimes have been obtained. Considering its nature, these criminal acts are very difficult to detect. And when it is discovered, banks and other financial institutions do not want the perpetrator/perpetrators to report them to the police or the financial police, for reasons that they fear that their authority in front of customers will not be reduced, or that they will not be exposed and disclosed by intelligence - police investigation some data important for the operation of banks. The greater number of detected cases are the result of the connection with some other type of crime. (Dzukleski; 2000)

The misuse of payment cards by the perpetrators is a crime with which they acquire illegal property benefits, but in order for that crime to be successful in the sense of acting for a longer period of time, it should not be detected, and if the police receive information as soon as possible, „cover up“ the electronic evidence and traces so that it is not revealed

and the perpetrators avoid prosecution. For successful criminal activity, perpetrators often join together in smaller or larger criminal groups in which a plan is developed for the recruitment of perpetrators, their direction for criminal activity and protection from criminal prosecution.

Electronic payment card fraud is a growing challenge for merchants and businesses with fraudulent transactions increasing by nearly 46% year-on-year in 2021, amounting to more than \$32 billion in 2021, and this number is expected to increase to \$38.5 billion by 2027. (<https://www.arkoselabs.com/explained/payment-fraud/>).

## **2. ABUSE OF PAYMENT CARDS**

Payment cards, as modern non-cash payment instruments, are used for the identification of the issuer and the user of the card, on the devices for performing financial transactions (ATMs), in order to ensure the data entry for the given transaction. The spread of payment cards, the possibility of their application and the availability of the most modern information technologies, made them extremely attractive for a large number of criminals and criminal groups all over the world. Particularly vulnerable have become the markets where payment cards are introduced in the payment circulation, where they do not have enough experience in electronic operations and where there is no system to prevent such abuses, as well as in countries with a very high standard, where the system of online trade has been developed and banking. Today, payment cards can be used to withdraw cash from ATMs, from bank counters, to pay for goods and services, at points of sale equipped with POS terminals, to pay in electronic commerce, as well as to pay for goods ordered by phone or by mail. . Payment using payment cards can be made online, without going to a bank or merchant, from home, both in our country and abroad. It is on the Internet that there is the greatest danger that the electronic data from the payment cards will be compromised, the data will be misused in future transactions, but also through the sale of the data and the spread of the criminal network.

In order to buy online, the buyer needs to have electronic payment card data, such as the card number, validity (date of issue and date until which it is valid) and CVV2 number (Card Verification Value 2 - a three-digit number located on background from the card). The perpetrators come to this data in a criminal way, by stealing the payment cards, recording them when using the post terminals through tactics and techniques that are applied, photocopying in a "convenient situation" or using data that is „bought“ through organized criminal groups of special pages on the Internet.

The use of payment cards represents the existence of complex contractual relationships between card users, their issuers, brands, etc. The possible unauthorized use of payment cards, in addition to being incriminated as a crime, is also a basis for compensation of damages between the participants of the payment system. For these reasons, the effective prevention and detection of such crimes is a condition for the development of a secure payment system that would provide maximum positive externalities. Effectively dealing with crime is the main factor for the growth of the economy, but also for the level of well-being and security of the citizens. (Petrevski and Jakimovski; 2015)

Misuse of payment cards is a computer crime that is incriminated in two criminal acts in the Macedonian penal legislation, namely: „Damage and unauthorized access to a computer system“ in Article 251 and the crime „Making and using a fake payment card“ in Article 274 - b. These two crimes have the same and similar criminal characteristics. The same criminal characteristic is the computer, computer systems and data as a means of

execution (instrumentum operandi), the area of criminal activity (radius operandi), while the differences are in relation to the manner of execution (modus operandi), the place of execution (locus operandi) and the time of execution of the criminal acts (tempus operandi).

### ***2.1. Criminalistic characteristics of the crime Damage and unauthorized access to a computer system***

Damage and unauthorized access to a computer system is a typical computer crime from Article 251 of the Criminal Code of the Republic of Macedonia (Official Gazette of the Republic of Macedonia No. 19/04), where it is determined in the name itself that the computer system is a means of execution or an object of criminal assault. It is a complex incrimination in which the Macedonian legislator incriminated several criminal behaviors or several ways of execution. Criminal behaviors with elements of payment card abuse are provided for in paragraph 2, where the existence of a criminal offense is provided for when „Whoever enters another's computer or system without authorization with the intention of using its data or programs for the purpose of obtaining an illegal property benefit for himself or for another or causing property or other damage or for the purpose of transferring computer data that was not intended for him and that he obtained without authorization to an uninvited person“, and with the paragraph „Whoever intercepts, using technical means, the transfer of computer data without authorization of a public nature to, from and inside a certain computer system, including electromagnetic emissions from a computer system that supports such computer data“. For the criminal behaviors from the specified paragraphs 2 and 3, a fine or imprisonment of up to 3 years is provided, and if a larger property is acquired benefit or inflicted greater damage, a prison sentence of 6 months to 3 years is foreseen. In relation to the method of execution and as a function of that, the legislator in paragraph 7 also criminalized criminal behavior related to the unauthorized creation, acquisition, sale, holding or making available to other special devices, means, computer password, access code and similar data with which the whole or part of the computer system is enabled for access, computer programs or computer data intended or suitable for the commission of criminal acts, for which a fine or imprisonment of up to 1 year is provided. Criminal liability is also foreseen for legal entities and confiscation of special devices, means, computer programs or data intended for the execution of the acts.

Ways of committing the specified crime with elements of misuse of payment cards are the following:

- Unauthorized entry into another's computer or computer system with the intention of using computer data or programs for the purpose of obtaining an illegal property benefit.
- Unauthorized interception, using technical means, transfer of computer data is a criminal act that skilled perpetrators perform by installing special devices with the help of which computer subtasks are intercepted or redirected through computer systems. It is a criminal act that takes place with a special command of a computer system, and the interception or redirection takes place in the so-called n. cyber space.
- Unauthorized creation, acquisition, sale, holding or making available of special devices, means or computer passwords, codes for accessing computer data, actions that are necessary for the execution of the aforementioned criminal actions.
- Unauthorized use of payment card data provided in an "illegal" manner by recording, photographing, scanning payment cards and using them in electronic commerce.

Criminal acts are related to acts of entry, exit, programming, data collection, masking, surreptitious entry and use.

Entering a computer system means entering a code (code, password) and then working with data in the computer system, if it is a computer system of a state authority, financial institution, private legal entity, each of the employees has their own code and work authorizations with data. By entering the computer system itself, the person can make certain manipulations of the input data, known as „data diddling“, or mixing of the data through changes that can be made in the process of creation, recording, transfer (transport), encryption, review, control, conversion or transmission of data entered into the computer. These manipulations can be done by: adding data, omitting data (selectivity during data entry), modifying existing data, replacing with other data, deleting, entering false data. (Petrović; 2001)

Criminal actions related to entering a computer system are actions taken by other persons, who in any way reach the code of the employee or the authorized person, in order to cause certain damage through the manipulation of computer data, and thereby to acquire unlawful property benefit, by transferring the responsibility to the one who is the user or in charge of the code (code, password). These are criminal acts with elements of computer theft, identity theft, computer embezzlement, and are criminal acts related to unauthorized access and intrusion into a computer system.

Entry into a computer system, especially the unauthorized or unauthorized one, is also called breaking into the computer system or „hack“ and is compared to the use of certain mechanical force to enter closed spaces, such as classic serious thefts - property crimes, committed by overcoming obstacles. Here we are talking about property computer crime where the overcoming of obstacles is in a very subtle way, electronically and thus endangers the confidentiality of any computer system, or an unauthorized electronic intrusion into a central computer system and its database. Acts are mostly carried out by hackers, who through their personal computers also engage in other information systems that they primarily use over the Internet. These perpetrators cleverly bypass protective mechanisms and parts that are not always done with malicious motives, but the perpetrators try to demonstrate informational skills that point out the weaknesses of computer programs, and especially of computer systems in vital institutions. Thus, the target of these perpetrators or criminals are often many computer networks, which are rightly expected to have maximum protection against electronic intrusions, such as: military computer communications, computer systems of intelligence services and other state authorities and institutions.

A covert entry is a covert software mechanism placed in the computer in order to enable the bypassing of the system protection mechanisms, that is to enable the user program to execute privileged (system) instructions. Backdoor or „backdoor“ are the most commonly left opportunities by developers in order to allow future access and modification or fixing of certain errors. But regardless of why they are left, these entrances, they represent an unprotected and very weak point of the system, so the attacker, especially the external attackers, who, if they are skilled enough, focus on discovering such program weaknesses in computer systems, and then use for the achievement of a criminal goal, which can be only by causing damage, but they are mostly used for the acquisition of illegal property benefits.

The use of hidden entrances to computer systems is the most common target of skilled „hackers“ who also use hacking for criminal purposes or by hacking find „weak points“ of financial institutions and enter the database - transaction accounts and their owners. they download the numbers and tags of the payment cards and then sell them on the Internet to other „interested criminals“, who later pay for products and services through the

e-market with the data on other people's payment cards obtained in this way. Or procurement of products and services through electronic ordering and electronic payment. (Nikoloska; 2019)

*Example: The Stip police, due to the existence of grounds for suspicion of the crime of „Damage and unauthorized access to a computer system“, filed a criminal complaint against a perpetrator who committed the crime in a way that illegally provided data from a debit card to a person from Italy, with temporary stay in Shtip, after which he performed 72 successful transactions at 27 points of sale and acquired an illegal property benefit of 70,300 denars. The motive is the acquisition of property benefit.*

According to the police practice of discovered and solved cases of unauthorized entry into a computer system and elements of payment card abuse, the most common way of committing this crime is with prior criminal behavior of theft or aggravated theft in which payment cards are stolen and payment is made to invoices, payments in the trading network as well as theft of payment cards, unauthorized acquisition of data from transaction accounts and payment cards, after which the perpetrators withdrew cash from ATMs, paid invoices, paid in a trading network and paid for goods and services over the Internet. As a more characteristic event, there is also a case in which the perpetrator, in the capacity of a market employee, in 11 cases took pictures of payment cards from customers with a mobile phone, after which, together with another person, they made unauthorized payments of electricity bills and top-up of bills, acquiring property rights. benefit over 530 thousand denars.

According to the time of execution and the area of criminal activity, the time is related to the time of providing data from payment cards and the time of their misuse, and the same are used on several occasions, but the consequence is in several places depending on the purpose of their misuse.

## ***2.2. Criminalistics characteristics of the crime Making and using a fake payment card***

The production of fake payment cards implies the production of the same from an object - plastic that is similar to the payment card, according to a standardized payment card format and using appropriate devices and processes of entering real data so that they can be used. In order to create them, it is also necessary to provide data that is essential for withdrawing financial funds from ATMs or using them in electronic commerce on the Internet. (Mandiš, Putnik, Milošević, 2017)

Macedonian legislator in the 2009, incriminated a special crime which sanctioned the criminal behavior of *making* and *using* a fake payment card. Namely, it is stipulated that the crime exists when: A perpetrator who makes a fake payment card with the intention of using it as a real one, or obtains a fake card with such intention, or gives it to another person for use, or the one who uses the fake card use as real will be punished with imprisonment from six months to 5 years and a fine. The same penalty is provided for in cases where the offender obtains bank data from real payment cards and data on the holders of those payment cards with the intention of using them for the production and use of a fake payment card or gives the thus obtained data to another with such intention. The offense is graded, so that a prison sentence of one to 8 years of imprisonment is provided for in cases where the perpetrator acquires a greater property benefit, or if the crime is committed by a member of a group, gang or other criminal association, the prison sentence is at least 4 years. Criminal liability is also foreseen for the cases when the crime is committed by an employee or person in charge of the legal entity, but in the name and at the expense of the legal entity, parallel liability is foreseen.

The following actions for the execution of the crime are foreseen:

1. Production of a fake payment card.
2. Procuring a fake payment card.
3. Use of a fake payment card.

The production and use of a fake payment card is a complex crime where the perpetrators work on preparations, first of all, to provide funds for the purchase of technical means and instruments for downloading the necessary data from real credit cards of citizens and legal entities. However, in certain criminal cases of organized criminal groups, there is also a connection between the perpetrators from the „outside“ and the perpetrators „from the inside“, i.e. bank employees who have account data and all the necessary data from payment cards and they have a criminal role of „giving data to perpetrators from outside“. But those perpetrators do not commit this crime, they are treated as helpers, and they are also responsible for abuse of official position and authority or embezzlement in the service. When committing this crime, the practice notices tightly organized criminal organizations and loose criminal groups, but they have the same criminal goal, which is to find the easiest way to extract money from other people's accounts, without it being a more serious form of theft. This crime has criminal behaviors similar to classic crimes with elements of theft and fraud, but also economic crimes due to the existence of elements of abuse of powers entrusted to the service.

As criminal actions that precede the creation and use of fake payment cards are the collection of data from real payment cards and data about their owners, and of course the „thickness of the bank balance,, is important data. If the perpetrators are „malicious“ and download data from payment cards that are in negative balance or have very low amounts, „they will be at a loss“. That is, they will invest more to make the card, but they would not be able to get anything out. For those reasons, data is collected on individuals and legal entities with „fat bank accounts“. Those data and the rest are quite important for making a selection from the „recorded“ with special instruments, computer data, and then by inserting them, fake payment cards will be produced.

In order to secure data from real payment cards, perpetrators acquire special equipment and instruments that are „miniature“ and are placed in eligible places on ATMs and they have the power and capabilities to record the necessary data from real payment cards, then the instruments are removed and the data are extracted from their memory, which are created with a special computer program and printed on special printers, and the perpetrators also procure suitable „plastics“ that correspond to the real cards. Special devices are called skimmers, which are specially made, with a certain memory capacity, and they are purchased on the illegal market, besides skimmers, miniature cameras are purchased and installed. It is a crime that is committed in most cases by organized criminal groups and that is tightly organized, where the perpetrators have divided criminal roles and pre-agreed „earnings“ or a percentage based on criminal involvement. Organized criminal groups represent a set of individuals, who have common interests, and the realization depends on all members in the group. Organized criminal groups can also have a loose structure, that is, only perpetrators who engage in specific criminal tasks during a criminal operation. For example, a loose criminal group is when people are found to only use fake payment cards at ATMs designated for them and hand over the money they withdraw to the „customer“. They receive a certain percentage for their work, but the people who withdraw money with fake payment cards are usually discovered and they answer, sometimes even themselves, claiming that they don't know the people who ordered them.

The most complex criminal role or the „brain“ of the criminal operation are the perpetrators who procure equipment or devices - skimmers, then they train other persons - perpetrators who install the equipment on pre-selected ATMs (depending on the criminal operation, ATMs are selected in high-frequency places or in small and quiet places). It is the choice of the organizer or the decision of the persons who are in charge of „recording the situation on the field“. After recording the data, the perpetrators with their professional knowledge and skills create the fake payment cards to get a „real face“. Only then are they used at ATMs or in the trading network. But the perpetrators who use them are the most suspicious and sensitive part of the operation itself, it is logical that if they fail to extract money, the entire previous work also fails.

Criminal organizations have the highest organizational form of perpetrators, which are characterized by an internal organizational structure where a hierarchical arrangement prevails, strict discipline, obedience and loyalty prevail, with a built long-term strategy and elaborately elaborated criminal tactics of action. (Nikoloska & a Gjosheva-Krsteski; 2021)

To commit the crime „Making and using a fake payment card“, computer technology is used through various devices to secure data from payment cards, but also devices to which that data is transferred and fake payment cards with real data are made. Whereas, the time of the criminal act is considered individually for all involved in the criminal situation and there should be „connection“. This means that computer data, which are the content data of the payment cards and the time of each executed transaction with such a card, were previously provided, and the area of criminal activity is related to the use of computer systems and electronic commerce in order to expect financial benefit.

### 3. VOLUME, STRUCTURE AND DYNAMICS OF CRIMINAL OFFENSES WITH ABUSE OF PAYMENT CARDS

Year	Criminal act				Total	
	Article 251	%	Article 274 – б	%		
2020	85	82,5	18	17,5	103	12,6 million denars
2021	71	85,5	12	14,5	83	19,6 million denars
2022	138	79,8	35	20,2	173	15,7 million denars
Вкупно	294	81,9	65	18,1	359	47,9 million denars

**Table No. 1**

In the investigated period 2020 - 2021, for the two investigated computer crimes with elements of misuse of a payment card, „Damage and unauthorized access to a computer system“ according to Article 251 and „Production and use of a payment card“ according to Article 274 - b were detected a total of 359 criminal acts, of which 295 are for the first mentioned, and 65 for the second mentioned. This crime has caused damage in the millions. Of the detected cases, 81,9 % are for „Damage and unauthorized access to a computer system“, and this indicates the fact that criminals are more focused on securing data from payment cards and use them immediately, especially in electronic commerce on the Internet, while less are engaged in organizing the „theft“ of data and the production of fake payment cards and their use.



#### 4. CONCLUSION

The abuse of payment cards is a form of computer crime that manifests itself through several ways of execution and as a crime that is preceded by previous illegal and illicit activities aimed at securing data from payment cards and misuse of data by penetrating a computer system, most often on banks and extracting financial assets through electronic payment without physical use of a payment card, while the second way is with previous activities of using IT devices for unauthorized recording of data from payment cards and based on that data, creating a fake format, which meets the standards to be used, but with real data content. This criminality in relation to the criminal characteristics differs according to the way of execution which is important for the classification of a specific crime which should be based on relevant electronic evidence and that evidence which is connected to previous criminal acts and acts of extracting money, most often from bank accounts of citizens, but also of legal entities.

In the Republic of North Macedonia, this crime is a reality and with an increasing trend, both in terms of discovered cases and in terms of the amount of real property benefit, i.e. damage caused.

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# **FEMICIDE – CRIMINAL CHARACTERISTICS OF THE MURDERS OF WOMEN IN THE REPUBLIC OF NORTH MACEDONIA**

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## **1. INTRODUCTION**

Murder is the most serious violent crime, where the man in the most brutal way resolves contradictions and conflicts with other people, attacking one person's life. Man is the only creature with urges which can make him a killer of his own kind without any rational, biological or economic gain. This negative social phenomenon when criminals commit murders is a serious problem facing humanity and the civilized world, especially today, because the intensity is increasing. Murders cause a stormy and undesirable reaction in the public, especially when they are carried out in an organized manner and manifest brutality, ferocity and recklessness of the perpetrator. The knowledge that a murder has been committed among the population represents negative feelings of insecurity and unprotected.

Femicide, as a gender-based murder of women, has its own criminal characteristics that distinguish it from other murders. The murders of women are serious crimes that are committed due to various circumstances and motives of the committers, and as more pronounced are intimate - partner murders due to jealousy, revenge and the same are within the framework of family violence. The femicide is not treated as a distinct crime in the Macedonian legislation, but it is regulated in Article 123 "Murder" of the Criminal Code.

The commission of the crime "Murder in domestic violence" is provided as an aggravating circumstance of the basic crime "Murder" in the same article, paragraph 2, point 2, i.e., with imprisonment for at least ten years or with life sentence, whoever deprives another of his life will be punished when committing domestic violence. Whoever deprives another of his life in an instant, brought to a state of strong irritation through an attack or by serious insult or as a result of domestic violence by the murdered person, a lesser punishment is provided, i.e., imprisonment from one to five years, by the article 125 "Murder in an instant" (or Manslaughter) (Criminal Code of the Republic of North Macedonia "Official Gazette of the Republic of Macedonia" No. 185 dated 12/30/2011). The Convention of the Council of Europe on preventing and combating violence against women, including domestic violence (Istanbul Convention), was ratified by the Republic of North Macedonia in December 2017, and it entered into force in July 2018. The Istanbul Convention recognizes the various forms of violence against women and femicide resulting in death, which precedes physical violence. In January 2021, the Republic of North Macedonia passed

a law that recognizes all forms of gender-based violence and provides for the protection of women victims from all forms of violence (Law on prevention and protection from violence against women and family violence "Official Gazette of the Republic of North Macedonia" no. 24/2021). With the changes in the new Criminal Code (Act on Amendments and Additions to the Criminal Code, "Official Gazette of the Republic of North Macedonia" No. 36 of February 17, 2023), the following elements have been aligned: rape, stalking, sexual harassment, psychological violence, genital mutilation and for the crimes for the purpose of preserving the honour, stricter punishments are provided. In the working version of the group for amendments and additions to the CC, in the chapter crimes against life and body Article 174 (previous Article 123) in point 2, paragraph 2 is added or gender-based violence against women. While in article 176 (previous article 125) violence against women is added. (ener.gov.mk)

Every murder of a woman is the same according to the victim and they differ according to the method of execution (*modus operandi*), according to the means of execution (*instrumentum operandi*), the time of execution (*tempus operandi*), the place and space (*locus i radius operandi*), the relationship of the victim (*victima*) and the committer (*auctorem caedis*), traces (*corpora delicti*), the personality of the victim (*de victima personalitatem*) and the personality of the committer (*de auctor personalitatem*).

Through the study of the specific criminal characteristics of the crime, information is gained about the specific situation in which the murder was committed, which represents a system of elements that reflect the femicide.

## **2. CRIMINALISTIC CHARACTERISTICS OF MURDERS OF WOMEN**

Criminology as a science is crucial for us through the study of the characteristics of a crime, which in principle represents a system of elements that surrounded the perpetrator at the time of the crime: the way of committing and concealing the crime, the criminal situation, the traces of the crime, the personality of the perpetrator and the personality of the victim. We have a tendency to obtain information that will form the full picture of the situation, and we will also help in building the strategy for preventing and dealing with the perpetrators of murders of women, through the construction of measures for successful investigation, detection of the perpetrators of murder, over construction of measures for a successful investigation, their prosecution through legal process procedure and sanctioning. In this paper, the criminalistic characteristics of the crime "Murder of women" will be expounded.

### ***2.1.Manner of execution (modus operandi)***

The manner of committing a crime contains all the actions taken by the committer from the moment of obtaining a motive for committing the act, which would mean the taking of the preparatory activities, the execution of the act and the taken actions of hiding the crime. For the purposes in criminalistics, all the actions (preparatory, execution and concealment) taken by the committer through the way the crime was committed, are important for the revealing process of discovering, clarifying and proving the crime and the committer. The importance of interest in the criminal law is placed only on the manner of execution (Vodinelic, 1985:404). For the exposure of the committer and the discovery of the evidence connected with him, it is of great importance to understand the way of execution for the formation of the operational and investigative forms. The method of execution is obtained from the criminalistic question "How was the crime committed?"; but that point of view is

too narrow and insufficient and does not give the criminalistic characteristic of the method of execution of the crime, which contains the motive, the purpose, the willingness to commit the action, etc.

The study of the *modus operandi* in the case of murder is defined as a significant clue, which points to the existence of someone's intention to take someone else's life depending on the character, his knowledge, expertise, abilities, motives, etc. of the perpetrator himself ((Nikolovska, 2015:269). From previous experiences, the most common ways of committing crimes are: shooting with firearms, hitting with objects, poisoning, drowning, pushing from a height, burning and not giving water and food. Murder can also be caused by psychological pressure and causing psychological pain, by causing fear, psychological traumas that due to the expansion of strong emotions can cause death (Koraljihc, 2007:37).

### ***2.2. Means of execution (instrumentum operandi)***

The means of committing the crime - femicide are considered to be all objects, weapons and tools that can cause deadly injuries. The most commonly used means of committing the crime are: lethal stabbings, shooting with a firearm - gun, use of physical force - strangulation, blow with a blunt object - boxer, rolling pin, blows with fists and kicks, blows with an ax and burning, according to the analysis of cases of femicides 2017-2020 carried out by UNDP

([https://glasprotivnasilstvo.org.mk/wp-content/uploads/2021/12/Femicid\\_14\\_MK.pdf](https://glasprotivnasilstvo.org.mk/wp-content/uploads/2021/12/Femicid_14_MK.pdf) ).

It is interesting to note that the perpetrator's desire for revenge on the potential victim, in circumstances of previous arguments, quarrels and slanders, often physical confrontations, is much stronger than the fear of the punishment for the committed crime.

### ***2.3. Execution time (tempus operandi)***

When the perpetrator took the action of execution or failed to take it, even though he was legally obliged to do so (for crimes committed by omission), regardless of when the harmful consequence occurred. The condition is that there is a cause-and-effect relationship between the act or failure to act and the harmful consequence, that is, the consequence is the result of the action of the perpetrator.

### ***2.4. Place and space (locus i radius operandi)***

The criminal offense was committed both in the place where the committer worked or was obliged to work, also in the place where occurred the consequence. The preparation and attempt of a criminal offense are considered to have been committed both in the place where the perpetrator worked, and in the place where, according to his intention, the consequence should have occurred or occurred. For the crime "Murder of a woman", i.e., in case of domestic violence, the place of execution is considered to be the home but also public space and parents' home. Most of the time, the violence preceded it, so the victim did not expect to be killed by the perpetrator. For femicides, the home is the most unsafe place for women victims of gender-based violence.

### ***2.5. The relationship of the victim (victima) and the perpetrator (auctorem caedis)***

The criminal situation includes all the circumstances that previously existed between the victim and the perpetrator, and that preceded the criminal event. In a previous relationship that existed between the perpetrator and the victim, we can distinguish situations of murder when:

- the perpetrator and the victim did not know each other at all;
- there was a one-sided relationship with the victim, when only the perpetrator knows the victim;
- when there is only a superficial social relationship between the perpetrator and the victim and
- when there are solid contacts between the perpetrator and the victim.

According to the personality of the perpetrator of gender-based violence, they are divided into: passive-dependent, cyclical and psychopathic (Nikolovska 2022:284). We can summarize that in the criminal situation the relationship between the victim and the perpetrator of the crime "Murder of women" precedes a current or former intimate partner, and the rest of the femicides are committed by close members of the immediate family.

## **2.6. Traces (*corpora delicti*)**

Traces in the narrower sense of the word mean the so-called identification traces on the basis of which the perpetrator can be identified or his group affiliation can be determined (Busarcevic, 2001:14). These are the so-called *corpora delicti*, where material evidence can be any object that can serve as a source of data for establishing facts important for the criminal procedure (Matovski, Buzharovska and Kalajjiev, 2011).

Depending on the method, means, place and time of execution and on the movement and behavior of the perpetrator before the execution of the murder, during the murder and after it, as well as whether the victim offered resistance, i.e., the mutual struggle at the scene, there can be various traces and objects relating to the perpetrator (Simonovic, Angeleski and Stojanovski 2009).

Material evidence is not evidence by itself, it should be brought in connection with the perpetrator and the crime. In order for an object to serve as evidence in the procedure, it should be:

- saved and undamaged and during the procedure it should not change its substance;
- to record the place of its discovery and
- to be able to be brought in connection with the object of proof.

The most common traces of the victim at the scene are: traces of blood, which can be found on the victim herself, the surrounding objects, the walls, on the floor, on the ceiling, as well as on the perpetrator (James and Norby, 2009). Traces as carriers of information can provide an answer to the nine criminal questions. Traces represent material evidence if the elements that establish their origin that is, the way of their derivation (identification), are established and proven.

The most common traces and objects of murder that can be found at the scene are:

- Biological origin: blood, semen, hair, saliva, feces, and other excretions, traces of papillary lines, traces of feet, nails, teeth, soil, dust, smells, etc.;
- Traces of means of execution;
- Traces of firearms;
- Traces of various tools that were used to commit the crime and
- Various microtraces that point to the victim and the perpetrator (Lukic and Pejkoic, 1975).

## ***2.7. The personality of the victim (de victima personalitatem) and the personality of the perpetrator (de auctor personalitatem)***

The term victim means any physical or legal person whose goods, rights, values and interests were directly threatened, damaged or destroyed by criminal behavior (Gaberov, 2016:5). The most basic and accepted definition is "Victim is limited only to physical persons who are directly affected by the criminal activity" (Nikolic - Ristanovic and Kostadinovic - Vilic, 2003).

Studying the victim refers to her relationship with the perpetrator and the crime, during the commission of the crime, before the commission of the crime, during the commission of the crime and after the commission of the crime, which can affect the discovery process. When collecting criminal information, equal attention is paid to the discovery, fixation and use of potential, latent-operational and evidentiary information which, according to the content, is of a criminal-victimological nature, which is also determined by each individual criminal-tactical situation.

Murders, as a rule, do not manifest suddenly, they are basically preceded by a frequent and striking situation on the part of the future perpetrator of the crime or a situation in which he lives and acts, from which we can draw the conclusion that there is a lesser or greater danger that was gradually more severe and more dangerous, culminating in murder (Bachanovic and Pejovska, 2017).

The study of the committer's personality, like criminal investigations of crimes, begins from the first moment of collecting the weakest grounds of suspicion, which is done in the first stage of the discovery process. Because the entire discovery process is intended at a search and is directed against the person for whom there are indications, that he is a possible perpetrator of the crime, for which appropriately operational versions of the way the crime took place are set up. The most appropriate definition of personality is "a unique organization of traits, which is formed by the mutual influence of the individual and the environment and determines the general, for the individual, characteristic way of behavior (Roth and Radonjic, 1980)". By this is following what the personality will be, that it depends on the hereditary characters, but for its formation, there is an influence from the environment in which the person lives and functions and from the influence of the factors that act in that environment. The explanation of the psychology shows what this science means by the term person and how a person becomes delinquent, that is, what characters a person should possess in order to be called a delinquent.

A normal person is considered with "emotional, intellectual and social maturity (Koteski 1996:72)". The absence of any of the listed characters conditions the appearance of imbalance and distortion of a person's development and directly contributes to the development of that person into a normal person of society. Intellectual disability causes a condition in which the individual is not able to reason correctly and have a balance in his actions and has difficulties in shaping the educational process. Emotional imbalance causes a situation where a person is unable to direct his feelings and emotions and react to them rationally and measuredly. Emotional imbalance causes unproductiveness and destructive actions towards the environment. The social immaturity of the person is reflected in how the person knows how to face the social flows, i.e., whether and to what extent the individual is correlated with the general events, whether he has difficulties making contacts with the environment and how he has organized his social life. Social deviance generates an inability to communicate with the environment and realize personal and general goals (Canepa 1973:421).

## ***2.8. On-site inspection for the crime of "Murder"***

Subsequently after the getting information about a criminal event, it is necessary to take a set of measures and activities in order to provide evidence for finding the perpetrator. In that direction is the acting according to the principle of operationality and speed of action, i.e., taking measures for on-site security and inspection by experts from a certain profile. Apart from hiring the police, it is necessary at this stage of the clarification and proof of the crime and the participation of the public prosecutor and the competent inspection authorities who will cooperate with the experts on the spot, but also with the separate expert institutions. The inspection is undertaken for the purpose of gathering traces of a material nature and as much useful information as possible. The quick exit to the spot allows for the security of persons who know certain facts and circumstances about the criminal event, i.e., about the method and course of the crime, and by talking to them can be obtained useful information. In order to clarify the crimes, the fast criminal procedure prevents the perpetrators from destroying the evidence, concealing the real factual situation or preventing the procedure (Malish Sazdovska and Nikolovski, 2018).

The inspection is an investigative action, which content is immediate sensory observation, determination and clarification of certain circumstances and facts that are significant for the procedure in a separate criminal event (Vodinelich 1971:375).

The definition of the term inspection as an investigative action refers to the observation of the persons participating in the inspection, i.e, the officials. This observation is not realized in an indirect way but on the contrary in an immediate way. Namely, the officials using the observation method, with all their senses, personally and immediately note all the necessary facts and circumstances of the criminal event, make a mental reconstruction and undertake specific activities in conjunction with the investigation.

The inspection should be carried out carefully during the whole time, meticulously and without missing the details. In doing so, the principle of urgency is respected, because in this way the perpetrator is prevented from escaping the country, hiding and destroying the evidence and items from the crime, finding false witnesses, etc. If going to the crime scene and carrying out an inspection is delayed, it is possible that there will be significant changes in the place, under the influence of atmospheric or other influences, or it is possible to intentionally or unintentionally destroy the traces. As part of the criminal investigation, the security of the scene starts from the moment the officials arrive and lasts until the end of the investigation. Securing the scene of the incident implies undertaking activities aimed at preserving the situation until the arrival of the inspection team. During that period, partial or complete destruction of the existing objects and traces, change of their position and mutual arrangement, i.e., prevention and causing contamination of the existing traces should be prevented. Police officers or emergency medical personnel are the first to arrive at the scene. They are the only people who see the scene in its original state. Their actions at the scene provide the basis for a successful or unsuccessful resolution of the investigation and the complete elucidation of the case (Malish Sazdovska and Nikolovski, 2018).

During the inspection, efforts should be made to get answers to as many golden questions as possible and to clarify all important circumstances and facts, but in any case, a professionally performed inspection should respond to the following important criminalistic rules:

- Does the event constitute a crime of murder, or is it a suicide, or is it a natural death;
- In what place and at what time was the murder committed;
- In what way and by what means was it carried out;
- The identity of the victim;



- Is it about one or more perpetrators?;
- The way he came, the movements and manner of behavior at the scene and the direction of departure of the committer;
- The motive of the perpetrator and
- Suspicious persons (Boskovich 1998:47).

From a forensic point of view, it is very important to carry out a detailed description and examination of the corpse during the inspection, as it can provide useful and detailed information. The description of the corpse is carried out by a doctor, a specialist in forensic medicine, and the external examination of the corpse in order to find traces and determine the method and means by which the murder was committed, in addition to the forensic medicine doctor, is also carried out by the forensic technician, as well as other experts depending from the means by which the murder was committed (ballistics expert, traceologist, etc.). Appropriate measures are taken at the scene to determine the identity of the corpse in accordance with criminalistic tactical and technical measures. The place where the corpse was found should be fixed in the inspection record, in a sketch, some photography should be done, so that problems do not arise later during a possible reconstruction of the criminal event. It is also necessary to describe the position of the corpse, while taking into account the position of the arm, leg, then whether he is holding any object in his hand, etc.

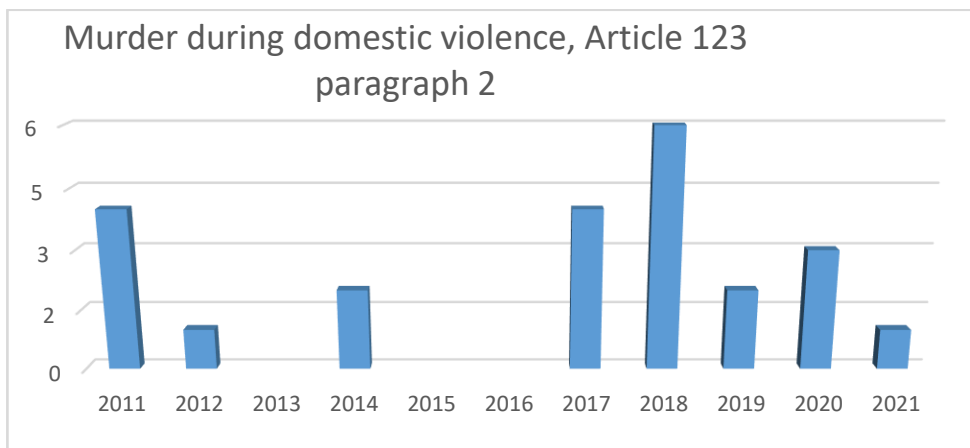
The description of the corpse is carried out according to the criminal-technical rules for personal description, which include: gender, height, age, color and shape of hair, shape of the nose, eyes and ears. The examination of the corpse is meant for finding micro and other traces and is undertaken in the dynamic phase of the inspection. Special attention should be paid to finding traces left by the perpetrator, as well as traces of soil from the perpetrator's shoes. The medical examiner describes in detail all visible injuries on the corpse and the condition of the corpse in terms of stiffness and dead spots. Depending on the method of execution of the murder, the hands of the victim can be an important source of operational information, regardless of whether it is traces under the nails or some other micro-traces originating from the perpetrator. Based on a forensic autopsy performed by experts, the approximate time of death can be determined and it can also answer the following questions: What was the cause of death and was it violent? By what means were the injuries inflicted? When did the death occur? Was the victim intoxicated? Are there injuries that can be concluded to be the result of self-defense? Are there microtraces under the nails and which ones?

From the beginning of the inspection until the completion of the criminal processing, the manager must cooperate with the expert, the forensic medical service, as well as the other experts and forensic technicians who are members of the team that works to shed light on the specific case (Boskovich 1998:47).

### **3. FEMICIDE IN THE REPUBLIC OF NORTH MACEDONIA**

In this paper will be analyzed the crime of "Murder", specifically the murders of women in the Republic of North Macedonia for the period 2011 - 2021, where will be extracted data about the previously mentioned criminal characteristics. The research will use statistical data from the Annual Reports of the Ministry of Internal Affairs, analysis of published papers and reports from the field, and based on the overall study, information will be obtained about the situation with femicide in our country during the research period.

After receiving a decision in response to a request for free access to information of a free character reg. no. 16.1.2-1245/1 dated 14.10.2022 from the Department of Public Relations and Strategic Affairs at the Ministry of Internal Affairs in the Republic of North Macedonia, are received data on female victims of the so-called "Murder in domestic violence" article 123 paragraph 2 of the Criminal Code of RNM for the period from 2011 to 2021 (table 1). From the statistical data obtained from the Ministry of Internal Affairs for the investigated period, 23 female victims were killed. It is characteristic that in 2018 as many as 6 women were killed, while in 2013, 2015 and 2016 no murders of women during domestic violence have been recorded.



*Table 1. Data on victims of domestic violence murders for the period 2011-2021.*

The above-mentioned data from the Ministry of Internal Affairs have been processed in an excel program for the purpose of the completed c.d. "Murder during domestic violence" Article 123 paragraph 2 of the Criminal Code of the Republic of North Macedonia in order to determine the type of victim, that is, what kind of relationship the victim and the perpetrator were in. From the statistical data for the researched period, 23 female victims were killed, it is characteristic that according to the type of victim, 14 are wives, 3 are women in extramarital union, 2 are mothers, 2 are daughters and the remaining 3 are victims of registered murders of women during domestic violence. It can be specified that by type of victim, the largest number of femicides were wives of the perpetrators (table no. 2).

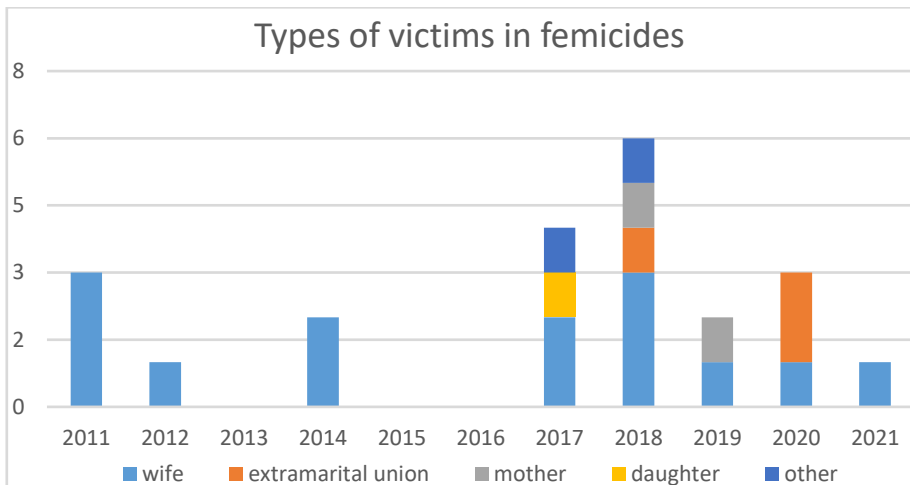


Table no. 2 Types of victims of domestic violence murders

From the statistical data that are publicly published on the website of the Ministry of Internal Affairs for the researched period in the time period from 2011-2021 no data has been published on the method of execution of the crime "Homicide in the context of domestic violence". It is characteristic that the crimes of domestic violence are published according to the method of execution: with a firearm, with a cold weapon, with the use of force or threat, and the other (<https://mvr.gov.mk/analiza/kriminal/31>). Table No. 3 presents the data in an excel table, where it is clear and evident that physical force or threat is the most common way of committing the crime, followed by cold weapons and the least firearms.

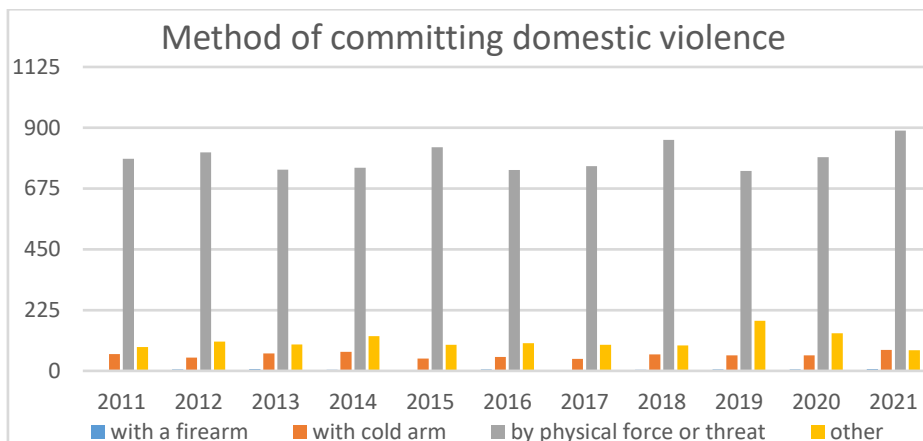


Table no. 3 Method of committing domestic violence

According to the research carried out from unofficial data by the National Network against violence against women and domestic violence in the Republic of North Macedonia for the time period from 2001 to 2016 data was obtained for 32 femicides. The figure was obtained from non-governmental organizations, media reports, etc. According to table no. 5, method of murder: blow with a blunt object 2, stab wounds in the neck and face 6, stab wounds in the stomach and back 4, blow with fists/kicks 2, firearm - pistol / automatic rifle

15, strangulation 4 and impacts with axe 7 are concluded to be the highest number with the use of firearms ([file:///C:/Users/user/Desktop/%D0%A4%D0%B5%D0%BC%D0%B8%D1%86%D0%B8%D0%B4%D0%B8/Femicidi-mk.final\\_.pdf](file:///C:/Users/user/Desktop/%D0%A4%D0%B5%D0%BC%D0%B8%D1%86%D0%B8%D0%B4%D0%B8/Femicidi-mk.final_.pdf)).

From the conducted research on murders in the Republic of Macedonia for the time period from 2008-2013, it was established that there were a total of 189 murders in the entire territory of the country. In the investigated period from 2008-2013 according to the motive, the murders in the Republic of Macedonia were mostly committed within the family circle due to broken family relations, arguments with members of the immediate family, but also due to arguments of members of the extended family. There have been also recorded murders committed by business partners and people who are in a love relationship, but murders for favoritism, contract killings, serial killings and murders that have the quality of a terrorist act have also been recorded. The largest number of murders were committed with firearms, while the number of murders committed with cold weapons or with the use of physical force by the perpetrators against the victims with acts of suffering and torture is smaller (Nikolovska 2015:235).

In the Republic of North Macedonia, femicide is still not a separate crime in the Criminal Code and is registered as any other murder.

## CONCLUSION

The purpose of this paper is to give a clearer image of femicides in the Republic of North Macedonia. The main problem was clarified through the criminalistic characteristics and insight of the crime "Murder during domestic violence" that can be qualified as femicide, for the time period from 2011 to 2021 in the Republic of North Macedonia.

It has been established that there is no common official statistics by the institutions and organizations (police, court, non-governmental sector, state institute, etc.) on femicides. The Macedonian legislation for this type of crime "Murder of a woman" does not yet recognize the crime "Femicide", but provides an aggravating circumstance if the murder was committed during domestic violence. Despite the changes in the Criminal Code according to the Istanbul Convention, where aggravating circumstances are given for the perpetrators of gender-based violence where the victims are women by an intimate partner or another family member, *the main recommendation is to insert a new crime "Femicide" and conduct of official statistics for that crime.*

23 murders of women - femicides were ascertained for the period from 2011-2021 for the crime "Murder during domestic violence" (table no. 1). According to the type of victim, the majority in 14 cases are the wives of the perpetrators (table no. 2). Due to the lack of sufficient data on the method of execution of the crimes "Homicide in domestic violence" from the officially published data on the crime. "Domestic violence" is given a graphic representation of the way the crime was committed for the researched period, where it was established that physical force or threats, use of cold weapons, and the use of firearms were mostly used (table no. 3).

The process of discovering, clarifying and proving the murders is a painstaking process, which requires staffing and an expert team with rich operational experience. The fact is that each individual case is a tragic case on its own, but from each case a conclusion and experience can be drawn about this widespread undesirable phenomenon.

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## SAFETY IN THE MEDICAL WASTE TREATMENT AND DISPOSAL IN NUCLEAR MEDICINE PRACTICE

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### Abstract

When conducting nuclear medical procedures, different categories of waste are generated; a large part of it falls into the category of hazardous medical waste as a result of the presence of biological material that is potentially infectious, as well as due to the radioactive isotopes it is contaminated with. Taking into account the characteristics and potential risks to humans and the environment, the treatment of nuclear medical waste differs from other medical and radioactive waste in several aspects. Activities of the nuclear medical facilities create this type of biomedical radioactive waste; these facilities have the obligation to collect, label and store the waste in a prescribed manner until it is taken over by a company which is authorized to transport, collect, keep and store hazardous medical waste. The purpose of this paper is to point out the importance of improving the quality of the management of this type of waste, with a focus on measures and procedures for the disposal of the waste generated in nuclear medicine. For this purpose, all activities during the course of nuclear medical practice should ensure the reduction of hazardous medical waste and its appropriate treatment in order to protect current and future generations from potential risks, by applying the prescribed legal regulations in that area.

**Keywords:** *nuclear medicine, radioactive waste, safety, waste management, law regulations.*

### 1. INTRODUCTION

Nuclear medicine is a discipline where radioactive isotopes are used for diagnosis and therapy of various diseases in the form of radiopharmaceuticals. Radiopharmaceuticals are obtained in radiopharmaceutical laboratories with specially prescribed procedures and protocols depending on the type of radioactive isotope, as well as the characteristics of the radiopharmaceutical substance in which the corresponding radionuclide should be incorporated. Each prepared radiopharmaceutical is subject to an examination of its radiochemical purity, which is usually performed by chromatographic methods or extraction in organic solvents. Depending on the type of research, radiopharmaceuticals can be administered to the patient orally, intravenously, subcutaneously, in the spinal canal, or can

be mixed with previously taken biological material from the patient (blood, serum, plasma, cerebrospinal fluid, urine and similar) during *in vitro* nuclear medicine procedures. Often, nuclear medicine tests require the taking of biological material from the patient for appropriate monitoring of the biodistribution and kinetics of radiopharmaceuticals after their application, in order to obtain important diagnostic parameters. Based on this very brief introductory review, it can be concluded that in nuclear medical practice, different categories of medical waste are produced daily, which are subject to special protocols for their safe treatment (Borota and Stefanović, 1992; Bogicevic and Ilic, 2007).

The purpose of this paper is to point out the importance of improving the quality of medical waste management, especially through measures and procedures for the disposal of radiological waste as a special category of medical waste that is generated in nuclear medical practice.

Based on the legal guidelines contained in Article 56 paragraph (5) of the Law on Waste Management ("Official Gazette of the Republic of North Macedonia" No. 216/21), the "Regulations on the method of managing medical waste, as well as the method of packaging and marking of medical waste" was adopted. Article 1 of this regulation prescribes the method of managing medical waste and the method of its packaging and labelling, while Article 2 explains the meaning of certain expressions used in this regulation:

1. **Medical waste** is waste which is generated in medical and health institutions (clinics, polyclinics, health centers, hospitals, outpatient clinics, practices, dental practices, dental laboratories, diagnostic laboratories, other practices that provide certain health services, research laboratories - institutes, veterinary societies, veterinary outpatient clinics and hospitals, veterinary laboratories, hospitals, etc.), which occurs as a product of used means and materials in the diagnosis, treatment and prevention of diseases in humans and animals. According to the List of types of waste, medical waste can be hazardous or non-hazardous.

2. **Pathological (anatomical) waste** is waste containing discarded parts of the human body - amputees, tissues and organs during surgical operations, tissues taken for diagnostic purposes, placentas, fetuses, animals and their parts.

3. **Infectious waste** is waste that contains pathogenic biological agents which, due to their type, concentration or number, can cause diseases in people who are exposed to, cultures and utensils from microbiological laboratories, equipment parts, material and utensils that have come into contact with blood or secretions from infectious patients or was used during surgical operations or isolation of patients, waste from dialysis units, infusion systems, gloves and other disposable utensils, waste that came into contact with experimental animals in which infectious material was inoculated.

4. **Waste from sharp objects** is waste that contains needles, lancets, scalpels and other objects that can cause stabbing or cuts, that is, the collection and disposal of which is subject to special requirements due to protection against infections. Sharps waste, contaminated or not, is considered infectious waste.

5. **Pharmaceutical waste** is waste that consists of/or contains pharmaceutical products, cytostatic drugs as well as other drugs that have been returned from the department where they were poured, dispersed, evaporated, prepared and unused, with expired use or should be thrown out due to their disuse for any other reason, containers and/or packages, objects contaminated by or containing pharmaceuticals (bottles, boxes).

6. **Chemical waste** is waste that consists of and/or contains discarded solid, liquid or gaseous chemicals that are used in medical, diagnostic or experimental procedures, cleaning and disinfection.



7. **Waste from pressure vessels** is waste from discarded vessels that contain inert gases under pressure mixed with antibiotics, disinfectants, insecticides that are applied in the form of aerosols, and may explode when exposed to higher temperatures.

8. **Heavy metals** are metals that consist of materials and equipment with heavy metals and derivatives, such as batteries, thermometers, manometers and the like.

9. **A local collection point (storehouse)** is a designated place at the level of a sector, department or unit where medical waste is generated.

10. **The central collection point** is a designated area where the waste from the local collection point is taken, which is properly separated, marked and provided only for the collection of medical waste.

## 2. GENERAL GUIDELINES FOR DEALING WITH MEDICAL WASTE

In Article 3 of the Rulebook on the method of managing medical waste and the method of packaging and marking of medical waste it is stated that medical waste should be handled depending on its classification and characteristics according to the List of types of waste. When dealing with hazardous medical waste, all necessary measures should be taken to prevent or limit to the greatest extent the impact on the environment, air pollution, underground and surface water, soil, risks to human health, i.e. to act in accordance with the guidelines of the Waste Management Law. Non-hazardous medical waste is handled according to the rules for handling communal waste.

### 2.1. Methodology in nuclear medicine during which medical waste is generated

Radiopharmaceuticals used in nuclear medicine are pharmaceuticals which contain radionuclides, and the radionuclides themselves can be used for diagnostics or therapy without additional components (e.g. radioactive  $^{131}\text{I}$ ). The purpose of the radiopharmaceutical is determined by the physical characteristics of the radionuclide it contains, and above all, by the type of radiation it emits (electromagnetic or corpuscular), by the energy of that radiation, as well as by the physical half-life ( $T/2$  – physical). Over 95% of all diagnostic radiopharmaceuticals are based on the use of technetium ( $^{99\text{m}}\text{Tc}$ ) as a radioactive tracer. It is also necessary to have the appropriate ligand available, that is, the component that should be radioactively labeled, and which has specific biodistribution characteristics. The ligand should be in the form of a non-radioactive radiopharmaceutical, the so-called "cold kit" which is a mixture of several chemical components which are necessary for the establishment of chemical bonds and the formation of a stable chemical complex of the radionuclide with the ligand (Borota and Stefanović, 1992; Bogicevic and Ilic, 2007).

A generator eluate of  $^{99\text{m}}\text{Tc}$  in the form of pertechnetate is used for the preparation of radiopharmaceuticals. During the process of radio-labeling of pharmaceuticals, radioactive and communal waste is created. Radioactive marking is carried out in a laminar chamber, where the initial selection of the waste is carried out, in order to separate the radioactive from the communal waste. Radiopharmaceutical laboratories also carry out radioactive labelling of therapeutic radiopharmaceuticals, usually with radioactive  $^{131}\text{I}$ . The marking is done in a specially ventilated chamber with a suitable filter before the air is expelled into the outside environment. All utensils used and contaminated during marking are disposed in lead bins designated for  $^{131}\text{I}$ . It is then taken to a basement bunker where it ages until safe radioactivity is reached, after which it is treated as medical waste.

Radioactive  $^{131}\text{I}$  for therapy is obtained in the form of a solution (liquid) or in the form of capsules with the intended radioactive dose prescribed by a physician specialist in nuclear medicine. After reception by a trained person, the shipment is stored in a cold room, in the original packaging with a lead-protected container, until its collection by the supervisory person in charge of these shipments. The shipment is unpacked, applied in the room intended for the application of radioiodine therapy, and the waste is stored in a lead container intended for  $^{131}\text{I}$  waste. After reducing the radioactivity to a safe level, the waste is treated as medical. Patients on whom high amounts of radioactivity have been applied due to thyroid gland therapy with  $^{131}\text{I}$ , are referred to hospitalization in an appropriate room and conditions that ensure a safe stay for the patient. After a several-day stay and regular measurement of the residual radioactivity by a medical physicist, they leave for home care after the radioactivity drops below 555 MBq.

Labelling of blood cells is carried out in a separate room for this purpose, with generator eluate of  $^{99\text{m}}\text{Tc}$  or radioactive  $^{51}\text{Cr}$  with specially prescribed procedures that are performed in a laminar chamber where imperative aseptic conditions are ensured. During the process of radioactive labelling of blood cells, radioactive, radioactive-biological, non-radioactive-biological and communal waste is created, which is then separated into the appropriate types of waste bins according to the waste type. Waste (biological or non-biological) that is contaminated with a radioactive isotope is disposed of in lead bins, separately for each of the isotopes used ( $^{99\text{m}}\text{Tc}$ ,  $^{51}\text{Cr}$  or  $^{131}\text{I}$ ).

With *in vitro* nuclear medicine, the concentration of different analytes in the biological material (serum, plasma, cerebrospinal fluid, urine, or gastric juice) is determined by an immunological reaction, during which either the antigen or the antibody is labeled with a radioactive isotope (most commonly  $^{125}\text{I}$ ).

The reception of the finished radiopharmaceuticals from the radiopharmaceutical laboratory is carried out by the radiological technologist who participates in their application to the patients. During the takeover, an inspection is carried out for the correct radiation protection of the finished radiopharmaceuticals, as an important prerequisite for the further selection of the medical waste. Namely, the containers for transporting the radioactive doses should be lined with lignin or a layer of other absorbent paper that will prevent contamination of the interior from possible radioactivity of the used syringes (Borota and Stefanović, 1992; Bogicevic and Ilic, 2007).

The application of radiopharmaceuticals is carried out by radiological technologists and physicians, during which three types of waste are created:

- **Communal waste** (packaging from used syringes and needles and other waste that does not contain biological material or radioactivity)
- **Biological non-radioactive waste** (means any type of waste that has been in contact with biological material and is contaminated by it)
- **Biological and non-biological radioactive waste**, which means any type of biological and non-biological waste (syringes, needles, packaging) that is contaminated with radioactive material.

## 2.2. Risks from the medical waste generated in the nuclear medicine practice

Due to its specific properties, medical waste from nuclear medical facilities poses a danger with a series of risks for both medical staff and non-medical staff who come into contact with it, the patients, the environment of the health facility in which it is created, as well as the danger of intrahospital infections. Potential risks of medical waste in nuclear medical facilities are the risk of injuries, infections, the action of chemical substances and radioactive decay from radioactive waste.

Injuries caused by sharp objects which are the cause of stabs, scratches and cuts are very common. Apart from mechanical trauma, such injuries are very often the cause of infections if the sharp objects are contaminated with biological material. According to the statistical analysis, the most endangered category are nurses and young physicians - interns, and hygienists among the non-medical staff. According to literature data, stabs caused by needles and other sharp objects contaminated with infectious material can be the cause of HBV infection in 18-30% of stabbing cases, in 1.8% for HCV infection and 0.3% probability of HIV infection (Cordo et al. 1997; Chartier et al., 2014). An estimated 1.3 million deaths per year worldwide are caused by infections that can be transmitted by contaminated injections and other sharp objects such as surgical scalpels (Miller and Pisani, 1999). Prescribing procedures for the disposal of sharps, as well as the availability of the prescribed procedure in written form with clear labeling of technically safe containers for disposal of used sharps and injection equipment, represent a significant step in minimizing such risks. In that context, there are also recommendations such as not to return the protective caps of the used needles, but to dispose of them directly in the special containers made of solid plastic with a lid that ensures safe transport and disposal of sharp objects (Tabish, 2005; Tsakona et al., 2007; Diaz et al., 2008).

In addition to stabbing incidents, microorganisms can cause infection through contact with damaged skin, inhalation and ingestion. That is why it is recommended to wear protective gloves, protective masks, as well as a ban on keeping personal items and food near the places where medical waste is created, selected and disposed of. The disorganization and inefficiency of the medical waste disposal system according to the appropriate European standards leads to its uncontrolled deposition in ordinary landfills, which represents a danger and risk for workers engaged in waste transportation (Radenović, 2008).

In the nuclear medical facilities, in order to achieve the imperatively important degree of hygiene and asepticity during the procedure of preparation of radiopharmaceuticals, many chemical substances are used as cleaning and disinfecting agents. They are used in different amounts, forms and concentrations, which can be irritating, corrosive or toxic. Exposure can be by contact through the skin or mucous membranes or inhalation. Medicines and cold kits of radiopharmaceutical preparations, as compounds of various chemical substances, often remain unused; this arises the need for their proper disposal. It is estimated that 2.3-4.6% of the drugs issued in one year remain unused (Stimac et al., 2007). Unused or expired medicines that are improperly disposed of pose a risk to employees as well as a kind of environmental risk. Heavy metals are found in thermometers, pressure gauges, batteries, electronics, fluorescent lamps and other devices used in nuclear medicine. The mercury found in mercury thermometers is very toxic, and can cause serious poisoning after inhalation because it evaporates and is absorbed in the lungs, while the concentration in the air must not exceed 0.1 mg/m<sup>3</sup>, because higher concentrations can lead to neurotoxicity (Pavlovic and Siketic, 2011).

When it comes to the medical waste from the nuclear medical activity, the radiobiological effects of the ionizing radiation from the used radioactive isotopes should also be taken into account. Two types of radiobiological effects of ionizing radiation are known: deterministic and stochastic. Deterministic effects occur in the form of reduction or damage to some organs as a result of damage or death of their cells according to the degree of radiosensitivity. These effects occur at a precisely determined threshold of the radiation dose of irradiation. The treatment of thyroid cancer, metastases, hyperthyroidism and euthyroid struma is reduced to the effect of destroying the target cells, but without damaging the surrounding organs, which would lead to noticeable deterministic effects. Stochastic effects occur during long-term exposure to low radiation doses, and for them there is no definite threshold of the radiation dose at which they would appear. Such effects occur in the form of malignancy, genetic damage or damage to the embryo/fetus. According to the ICRP-60 publication, the probability of malignancy induced by exposure to ionizing radiation (stochastic effect) in the general population is approximately 5% per Sievert for low doses, and about 1% for the occurrence of serious genetic diseases. For older people (over 60 years old) this probability is 3-10 times lower, while for children up to 10 years of age the probability of induced cancer is 2-3 times higher. For pregnant women the risk is the same as for the general population, but for the unborn child the risk is the same as for the young population. The radiation doses of family members and friends of patients treated with radioisotopes, according to the observations so far, are far below the threshold for the appearance of deterministic effects. Radionuclides, especially those that are emitters of corpuscular and high-energy electromagnetic radiation can lead to changes in the hematopoietic system and the development of malignant diseases in radiologists, X-ray technologists and other employees who work with sources of ionizing radiation (Duraković and Labar, 2003). When it comes to the radioisotopes that are used in nuclear medicine, from a radiobiological point of view, those with a therapeutic purpose are more important, considering that they are emitters of corpuscular radiation and, in principle, they are characterized by a longer physical half-life (Murthy, 2000; Govida, 2002).

### **2.3. Management of medical waste in nuclear medical facilities**

Treatment of medical waste includes activities related to its selection at the place of generation, collection, storage, treatment, processing, transportation and disposal. A key component in the management process that precedes all these activities is the reduction (minimization) of medical waste, which includes the following procedures:

**Correct selection (separation)** of medical waste at all workplaces where it is generated. For example, the packaging in which blood collection needles are packed should be placed in the communal waste container immediately after opening, while only the needle (syringe) that inevitably comes into direct contact with biological or radioactive material would be treated as medical waste.

A generator eluate of  $^{99m}\text{Tc}$  in the form of pertechnetate is used for the preparation of radiopharmaceuticals. During the process of radio-labeling of pharmaceuticals, radioactive and communal waste is created. Radioactive marking is carried out in a laminar chamber, where the initial selection of the waste is carried out, in order to separate the radioactive from the communal waste.

Two containers are used for waste disposal - one for radioactive and the other for communal waste. The following are disposed in the container for radioactive waste: disinfection pads, cotton swabs, needles and syringes contaminated with radionuclide during

radioactive marking. Disposal in the communal waste container includes: packages of needles and syringes, plastic protective caps of vials, packages of disinfection pads, which are not contaminated with radionuclides. After completion of the radio-marking procedure, the communal waste container is first emptied into a separate waste bin, lined with a black communal waste bag, placed near the laminar chamber. Then the container with radioactive waste, as well as disposable gloves, are emptied into a special lead bin lined with a yellow bag for hazardous waste. The empty glass vials after labelling and dividing the radioactive doses are kept closed in lead protective containers in the laminar chamber until the end of the working day. They are then removed from the chamber in a lead glass radioactive waste bin lined with a yellow bag. The glass test tubes used in the quality control procedure with the extraction method, after the control is completed, are closed with caps and left to age, in a separate bin lined with a protective layer of lead. Selection and disposal of waste is carried out by the persons who perform the radio-marking procedure.

During the radioactive labelling of blood cells, which is carried out in a laminar chamber, the medical waste is selected in separate containers, for radioactive waste, radioactive biological waste, non-radioactive biological waste with the appropriate marking, as well as for communal waste. Radioactive waste from the syringe and cell labelling needle is disposed of in a lead syringe guard. Packages of needles and syringes are disposed of in the communal waste container, while closed test tubes and syringes with biological material are disposed in the container for radioactive biological waste. After the radio-labelling procedure is completed, the communal waste container is first emptied into a special waste bin lined with a black communal waste bag, then the non-radioactive biological waste, and then the radioactive biological waste into a suitable lead waste bin placed in the same laboratory which is lined with a yellow bag. The radioactive waste lead container/shield as well as disposable gloves are then emptied into a special lead bin located in the adjacent pharmaceutical labelling laboratory.

Furthermore, the selection of waste also takes place during the application of radiopharmaceuticals to patients, as three types of containers are found in the room for the application of radiopharmaceuticals:

- Communal waste bin
- A small lead-lined plastic container for sharp non-radioactive medical waste
- A larger lead container with a pedal for disposing of the remaining radioactive waste.

After the application of the radiopharmaceutical, the needle is separated from the syringe and disposed of in the plastic container intended for sharp waste, while the syringe in the larger container for radioactive waste.

**The collection** of medical waste from the places of its creation is carried out in different packages depending on the type and characteristics of the medical waste, which ensure full protection of human health and the environment. For that purpose, use plastic bags, cardboard boxes, as well as special vessels and containers with suitable characteristics (color, shape, size and composition). Liquid medical waste (blood, urine, chemicals) should be collected in impermeable packages that prevent leakage or spillage of the contents and which should be tightly closed or sealed. Solid and sharp objects contaminated with biological or other potentially dangerous material (radioactivity) should be collected in vessels (containers) made of material that prevents their damage and falling or leakage of their contents. For this purpose, containers made of high-density plastic or metal, with a lid to close them, are the most suitable. All previously indicated packages (bowls and containers) should be filled to a maximum of two thirds of their total volume capacity, after

which they are closed and sealed. Lighter weight bags can be tied shut, but heavier bags are sealed with self-locking plastic seals. Sealed containers or sharps containers should be placed in marked yellow waste bags.

**The removal** of all types of waste is carried out by the hygienist on duty, namely communal waste once a day, while radioactive waste is collected once a week, which is collected in a large yellow bag for hazardous waste and aged until the radioactivity decreases to a safe level, whereby the level of radioactivity is checked by an authorized person-physicist. Radioactive glass tubes are removed once a week, and after aging and reduction of radioactivity to a safe level, the tubes are washed and returned to use. Biological radioactive and biological non-radioactive waste is separately removed after the work done on the same day. The biological radioactive waste is collected in a large yellow hazardous waste bag and aged until the radioactivity decreases to a safe level (the level of radioactivity is checked by a certified physicist), after which it is treated as non-radioactive biological waste (Kinni, 1998; Marinković et al., 2005).

#### **2.4. Procedure for selection, aging and disposal of waste in the Laboratory for *in vitro* hormone analyses**

Preparation for analysis is carried out in the Laboratory for Hormone Analysis - separation of serum from blood samples, analytical process and preparation of a result report from the performed analyses. During operation, biological, communal and radioactive waste is created. A source of radioactive waste is the reagents for performing radioimmunological analyses, which use  $^{125}\text{I}$  as a radiolabel. Communal waste consists of papers, cardboard packaging of reagents, lignin, while biological waste is divided into:

- **liquid biological waste** (waste liquid from an immunoassay analyzer and the rest of the biological material for analysis)
- **sharp biological waste** (tips from pipetting biological material)
- **solid biological waste** (caps from vacuum tubes, empty vials of control material, disposable gloves).

Radioactive waste is divided into:

- **Liquid radioactive waste** (liquid remaining after separation of immunocomplex)
- **Solid radioactive waste** (tips from pipetting of radioactive solutions and test tubes with radioactive immunocomplex)

Communal waste is collected in communal waste bins lined with black bags, while biological solid waste is collected in yellow containers with a biohazard label. The sharp biological waste is collected in special containers for that purpose, marked accordingly. The liquid biological waste is collected in special canisters suitable for the immunoanalyzer, while the test tubes with the remaining biological material for analysis are stored in special plastic containers (barrels) that prevent leakage. The liquid radioactive waste is collected through a vacuum pump in a special glass container for that purpose. Solid radioactive waste is collected in yellow plastic containers, which are placed in a metal bin with a sign of radioactivity. Waste is disposed of by the person who performs the pre-analytical and analytical procedure. Communal waste is removed by the hygienist on duty daily, before the start of the work process.

The hygienist removes solid biological waste (when the container is two-thirds full), as well as solid radioactive waste (when the container is two-thirds full, allowed to age to a safe level of radioactivity, and then treated as non-radioactive biological waste). The liquid biological waste is removed by the laboratory worker, after previous treatment with sodium

hypochlorite, while the liquid radioactive waste is removed by the laboratory worker, in a sink intended for that purpose in the drainage installation, with abundant washing with water. This aging and disposal is effectively carried out through a process of dilution and disposal in the drainage installation, if the level of radioactivity meets a certain limit, for example: a level of  $74 \times 10^{-5}$  KBq/ml (or 2Bq/100ml) for  $^{125}\text{I}$  and  $37 \times 10^{-5}$  KBq/ml (or 1Bq/100ml) for  $^{131}\text{I}$ .

Procedure for separation and disposal of chromatographic columns from  $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$  generator:

a)  $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$  generator after reception is placed in a laboratory for labelling pharmaceuticals, in a separate section protected by a double layer of lead bricks. The date of reception is written on the lid of the generator.

b) The  $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$  generator is used for one to two weeks, and then it is placed in its original packaging in a separate room, where it ages for one year.

c) After aging, the  $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$  generator is disassembled by the responsible person (with the help of a suitable tool) and the chromatographic column is removed.

d) The column is packed in a bag and the date of reception of the generator is noted. Packed in this way, all columns are disposed of in a hard plastic barrel, marked as hazardous waste.

The year of reception of the generators is marked on the barrel, and the barrels are kept in a special locked bunker in the courtyard of the Institute with limited access.

Procedure for selection, disposal and disposal of waste in laboratories for therapeutic application of  $^{131}\text{I}$ :

Shipments of  $^{131}\text{I}$  may be in capsule or solution form. The shipment is received by a trained person, and the shipment is opened by a person on duty immediately after receipt. The waste generated in the process is radioactive and communal. Communal waste in the form of cardboard and tin packaging is removed immediately outside the laboratory by the person on duty, while other communal waste (paper packaging from capsule applicators, syringe and needle packaging) is disposed of in a waste bin. Radioactive waste generated during handling of  $^{131}\text{I}$  solutions (empty vials, used needles and syringes) is disposed of in a lead bin for radioactive waste. Plastic applicators for  $^{131}\text{I}$  capsules are also treated as radioactive waste.

The hygienist on duty performs the removal of all types of waste. Communal waste is disposed of after the application of all capsular doses of  $^{131}\text{I}$  and again at the end of the week. Radioactive solid waste is removed once a week and collected in a large yellow bag for hazardous waste and aged until the radioactivity decreases to a safe level (the level of radioactivity is checked by an authorized physicist).

Procedure for selection, disposal and disposal of waste in quality control laboratories of radiopharmaceuticals:

The waste generated in the Radiopharmaceutical Quality Control Laboratory is radioactive and communal. Radioactive waste originates from the radionuclides with which the radiopharmaceuticals are labeled. The control procedure takes place in a specially organized space, behind leaded glass, with two containers for disposing of radioactive waste, protected by a lead layer and appropriately marked with the sign of radioactivity. In one container, the syringes containing the radioactive preparation in a very small volume, the paper pads with the strips for performing radiochromatography and the disposable gloves are disposed. In the other container, the tubes with the mobile phase are placed, tightly closed. Nearby there is a bin for disposal of communal waste, where paper packaging and other non-radioactive waste are disposed. The removal of all types of waste is carried out by

the hygienist on duty, namely communal and radioactive solid waste once a day, which is collected in a large yellow bag for hazardous waste and aged until the radioactivity decreases to a safe level (the level of radioactivity is checked by an authorized person-physicist). Radioactive glass tubes are removed once a day and after aging and reduction of radioactivity to a safe level, the tubes are washed and returned to use.

For efficiency in the management of medical waste, its correct identification is of great importance, which contributes to its minimization (reduction). At the least, identification of medical waste makes use of the so-called color-coded packaging system, namely:

- **red color** for pathological (anatomical) waste;
- **green color** for pharmaceutical waste;
- **yellow color** for the rest of the dangerous medical waste and
- **black or blue color** for communal or inert waste

Other than the color-coding system, for correct identification, the medical waste bins should be appropriately designated with an orange sticker with dimensions 7 x 9 cm which displays the icon of hazardous medical waste in black color with dimensions 7 x 7 cm. Under the icon, the phrase “Hazardous medical waste” is written in Macedonian and English.

In all places where medical waste is generated (laboratories, clinics), there should always be empty bins available for selection, identification and collection of the waste. Closed and marked bins with medical waste are transferred to the local collection point at least once a day (and more often if necessary) by the persons in charge.

The local collection point should be a well-ventilated room in or near the ward or unit where the medical waste is generated, where low temperatures can be maintained using a cooling system that should maintain a temperature below 10°C. Its location should be with limited access for personnel and inaccessible to animals, insects and birds. Radioactive waste is stored in a specially adapted room (bunker), until its activity is reduced to a minimum level, that is, to the level of natural background radioactivity (dose rate less than 0.05  $\mu\text{Sv/h}$ ). After the aging period in the bunker, the non-radioactive waste is transported to the collection point intended for medical waste. From the local collection points, the medical waste is taken at least once a week by the appropriate service to the appropriate sanitary landfills. The delivery of the medical waste is carried out by the persons in charge of handling the medical waste. At the same time, a waste identification form must be filled out, which, in addition to others, contains data on the type and quantity of waste (Nagalakshmi, 2000).



### 3. CONCLUSION

The treatment of medical waste resulting from nuclear medical practice must be organized in a way that ensures the protection of individuals, society and the environment from all its potentially harmful effects on human health and other biodiversity. Its disposal must be organized in a way that will not leave long-term consequences for future generations. The production of medical waste in all its forms must be limited to the smallest possible amount, as far as it is reasonably feasible, in relation to the volume of nuclear medical activities, the organization of work in individual nuclear medical centres, as well as the methods of disposal and neutralization that are available. All this implies the rationalization of nuclear medical procedures, as well as increasing the efficiency of all prescribed safety measures. Radioactive waste as a special type of waste in nuclear medical practice must be disposed of in a safe manner, including the long-term measures of radiological and nuclear safety.

The application of radiological and nuclear safety measures must be proportionate to the previously assessed risk of any unwanted situations and scenarios. The process of disposal and treatment of both medical and radioactive waste must be documented in all its stages. At the same time, the legal entity and the physical person who are responsible for the nuclear medical activity, that is, for the correct treatment of the medical and radioactive waste, are also responsible for the implementation of all prescribed measures for radiological and nuclear safety. For those purposes, it is necessary to provide all the necessary infrastructural facilities for the disposal of both medical and radioactive waste in the long term. Radiological and nuclear safety in the disposal of medical and radioactive waste should be optimized to ensure the highest level of radiological and nuclear safety as reasonably possible.

All risk limits must ensure that they are below the permissible limits. The prescribed procedures relating to the medical and radioactive waste produced in nuclear medical facilities must ensure the prevention of emergency situations that may arise during the execution of works, the creation and treatment, that is, the disposal of medical and radioactive waste. At the same time, specifically prescribed measures and activities that are necessary in response to the occurrence of any emergency situations must be established. All those activities should ensure efficiency in the protection and/or reduction of the consequences of any emergency situations, which will be justified and optimized to ensure an adequate contribution to the common good.

All of this is aimed at ensuring the protection of current and future generations from the risks arising from the activities of production, treatment and disposal of medical and radioactive waste in nuclear medical centres.

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## **THE ROLE OF POLICE DURING THE CRIMINAL PROCEDURE**

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### **Abstract**

Police cooperation in the criminal field appears as an effective tool for combating crime and all its manifestations. The realization of this cooperation is of elementary importance for the whole society, given that crime can permanently damage the social goods and values and lead to irreparable losses. Police cooperation refers to taking joint action between the police, institutions and bodies, primarily the bodies for criminal prosecution, control, etc.

Police cooperation works on two levels. The first is the state level that extends within the country and here they cooperate with the institutions in the country, the state bodies and the authorities of the Republic of Northern Macedonia. The second level is the country police cooperation performed by our police and the foreign police services in those parts of the organizations which have their own member states and which cooperate when it comes to crime. Such organizations are INTERPOL, EUROPOL, SELEC. Given this, it can be said that such cooperation is of immense importance, especially for those who provide it. The term "police cooperation" means joint work between the police and other authorities in order to ensure the effective detection of crime, which can appear in various forms, to detect and detain the perpetrators of crimes, as well as to undertake crime prevention activities. Regardless of the form in which crime appears, it represents a bad influence on society, threatens the life and well-being of a person and causes serious consequences. In this regard, police cooperation generally consists of joint work, exchange of experiences, professional training and education of staff, improvement of police work methods.

This means that in order to deal with crime, there must be an emphasized police cooperation, both between the police services and between the police and other institutions of the justice system, primarily within the state, and then internationally. Within the state framework, the police cooperates with the criminal prosecution authorities, such as the public prosecutor's office, with social protection departments such as the Center for Social Work, with the public, i.e., with the citizens and the media. While international police cooperation is realized between police services - members of some organizations such as

INTERPOL, EUROPOL, SELEC. In relation to the previously mentioned collaborations, international police cooperation is emphasized, because international crime represents a serious threat at the global level, but also a challenge for the states in the fight against its suppression. In addition, the prevention of international crime is unthinkable without the coordinated action of the police services in the states, when it comes to the prevention and repression of crime.

This means that international police cooperation is a basic instrument of police services in the fight against transnational crime.

The paper will discuss police cooperation in the criminal area. The cooperation between the police and criminal prosecution authorities and the police cooperation that takes place in international frameworks, will also be elaborated.

**Keywords:** police co-operation, international police co-operation, Ministry of Interior, affairs, penal area.

## 1. INTRODUCTION

The police is a service within the Ministry of Internal Affairs, which has its own duties and powers based on law. In this regard, police cooperation generally consists of joint work, exchange of experiences, professional development and education of staff, improvement of police work methods, etc. This means that in order to deal with crime, there must be an emphasized police cooperation, both between the police services and the police and other institutions of the justice system, primarily within the state, and then internationally. (Veljanovska, 2019: 56)

Within the state framework, the police cooperates with the criminal prosecution authorities, such as the public prosecutor's office, with social protection departments such as the Center for Social Work, with the public, that is, with the citizens and the media. While international police cooperation is realized between police services - members of some organizations such as INTERPOL, EUROPOL, SELEC.

In relation to the previously mentioned collaborations, international police cooperation is emphasized, because international crime represents a serious threat at the global level, but also a challenge for the states in the fight against its suppression. In addition, the prevention of international crime is unthinkable without the coordinated action of the police services in the states, when it comes to the prevention and repression of crime. This means that international police cooperation is a basic instrument of police services in the fight against transnational crime. And that leads us to a general formulation, according to which good and organized cooperation, as well as coordination, interaction between the police and other institutions, contact with international police services can lead to a barrier to crime and enable a high degree of civil security.

The creation of the police as an organization that will be in the function of the state arose as a need to ensure internal peace, but also defense against external enemies.<sup>viii</sup>

Historically speaking, this term originates from the Latin language (polis – city and politia – city service for ensuring peace). Here, the beginnings of the police are connected with the creation of the state, especially with the creation of the organization of the government. According to the English encyclopedia Britannica, the first police organization

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<sup>viii</sup> LAW ON CRIMINAL PROCEDURE, Official Gazette of the Republic of Moldova no. 150/2010 "15/97, 44/2002, 83/2003, 74/2004, 67/2009, 51/11, 100/12, 198/18

was created in Egypt around 3000 years BC. During that period, the empire was divided into 42 regions. For each region, the pharaoh appointed an official who was responsible for the administration of justice and security. In addition, one of the earliest forms of organized police was created by the emperor Augustus, who divided the city of Rome into 14 regions and for each region separately designated groups that were to take responsibility, in the form of police protection. (Stojanovski, 1997: 41)

The police in the 14th century arose as the state's response to crime and disorder. The French, during the reign of Emperor Napoleon Bonaparte, established the Gendarmerie as a model of state military police, which had a dual function, military and civilian. It was an example for many European countries. However, the management of the police, the use of force by the police, the powers it has, the handling of public disorder, have changed significantly towards the end of the 20th century. (Oxford Bibliographies, 46)

The police is part of the Ministry of Internal Affairs and is composed of organized police officers, who have duties and powers, within the service, after previously completed training and a signed contract with the Ministry of Internal Affairs. The police is in charge of maintaining public order and peace, respecting the law, fighting crime and more complicated tasks at the national and international level. In addition, it is also in charge of traffic controls. Police officers are uniformed members of the police, who can also perform tasks in civilian clothes if necessary.

The term police has multiple meanings and definitions and it would be wrong to give one fixed definition, especially due to the complexity of this profession. However, the most accepted definition is according to which the police is considered an executive body of the government that exercises legal powers through the very realization of the duties and responsibilities it has.

## **2. POLICE COOPERATION DURING CRIMINAL PROCEEDINGS**

According to Article 28 of the Police Law, some of its powers are attached:

- 1) checking and determining the identity of persons and objects;
- 2) collection of information;
- 3) calling;
- 4) deprivation of liberty;
- 5) apprehension;
- 6) retention;
- 7) search for persons and objects;
- 8) covert police action;
- 9) diverting, directing or restricting the movement of persons and means of transport in a certain space for the necessary time;
- 10) warning and ordering;
- 11) temporary confiscation of objects;
- 12) inspection or search of certain facilities and premises of state authorities, institutions exercising public powers and other legal entities and inspection of certain of their documentation;
- 13) entering someone else's home and other closed rooms;
- 14) stopping, inspection or search of persons, luggage and means of transport;
- 15) provision, review and inspection of the scene of the event;
- 16) receiving reports and complaints, submitting reports and notifications;
- 17) recognition;

- 18) public award announcement;
- 19) recording in public places;
- 20) polygraph testing;
- 21) collection, processing, analysis, use, evaluation, transfer, storage and deletion of data, as well as processing of personal data under conditions and in a manner determined by this and a separate law;
- 22) application of special investigative measures and
- 23) protection of persons covered in accordance with the regulations for the protection of witnesses.<sup>ix</sup>

The cooperation between the public prosecutor's office and the police is most obvious in the previous procedure.

The purpose of a preliminary procedure is to collect evidence about the probability of the committed crime and its perpetrator, in order to then decide whether to initiate court proceedings or to stop the proceedings. The preliminary procedure is divided into two parts: pre-investigation and investigative procedure, and the evidence collected in the pre-investigation and investigative procedure has the same evidentiary value, if obtained in a legal manner. The preliminary procedure is managed by the public prosecutor, for which the judicial police and the investigative centres of the prosecutor's office are at their disposal.

Police surveillance is an application of traditional powers of the police. In the criminal procedure, the actions taken the police in order to collect interesting information about crimes which they are prosecuted *ex officio*, they are called police intelligence. Theirs it was applied at the earliest stage of the criminal procedure. The term scout in legal literature is used instead of the word investigation, for the reason that distinguish it from judicial inquiry. (Trajkov, 2019: 39)

The investigative procedure or investigation is the second part of the previous procedure, which is carried out after the police investigations have been carried out, that is, after the preliminary investigation procedure. Police officers officially start the investigative procedure after receiving the order from the public prosecutor. On that order, which in practice represents only a formality and is preceded by a criminal report which the police officers from the criminal department submit to the competent public prosecutor's office. The order issued by the public prosecutor's office is a duty for the police officials to undertake investigative actions to prove the guilt of the suspect.

The evidence collected in the investigative procedure is of crucial importance for further criminal proceedings, because if they are sufficient, the next step is the initiation of charges against the suspect person. This evidence by the public prosecutor should be presented at the main trial, therefore their weight will directly affect the judgment against the accused person.

Investigative actions taken in the investigation are: search, temporary securing and confiscation of objects or property, collection of statements from the accused, collection of statements from witnesses, expert examination, inspection and reconstruction and special investigative measures. The public prosecutor informs: the defense counsel, the injured party or the suspect about the time and place of the performance of investigative actions, and may not notify them when it exists danger of delay. (Vitlarov, 2012:16)

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<sup>ix</sup> LAW ON POLICE "Official Gazette of RM No. 114/2006" 6/09, 145/12, 41/14, 33/15, 31/16, 106/16, 21/18, 64/18

According to Article 46 of the Law on Criminal Procedure, the judicial police consists of police officers from the Ministry of Internal Affairs, Financial Police Administration and authorized persons of the Customs Administration who, in accordance with the legally established scope of work, undertake measures and activities for the detection of criminal acts, arrest and reporting of perpetrators of crimes, provision of evidence of crimes and other measures for the smooth conduct of criminal proceedings, members of the judicial police in the investigative centres of the public prosecutor's office and officers assigned to the public prosecutor as needed. (Buzarovska, 2010: 19)

The purpose of the pre-investigation procedure is to provide the public prosecutor with material so that he can assess whether, according to the evidence obtained, there are grounds for suspecting that a certain person has committed a crime, so that he can pass an order against it for the implementation of an investigative procedure.

The pre-investigation procedure usually begins with police investigations, which the police begin under certain legal conditions either *ex officio* or at the request of the public prosecutor, whereby the obligation of the police to immediately notify the public prosecutor of the measures taken is prescribed. At this stage, the police still retain a certain autonomy and do not have to wait for special orders from the public prosecutor, but are obliged to take all actions in the direction of discovering the perpetrator of the act and providing traces and objects that can serve as evidence and collect all information that could be useful for conducting the procedure.

The measures and actions taken by the police in this phase are called police investigations and are taken in order to:

- finding the perpetrator of the crime;
- preventing the escape or hiding of the perpetrator or participant in the crime;
- discovering and securing traces of the crime and objects that can be used to establish facts;
- collection of all notifications that could be useful for the successful conduct of criminal proceedings

For this purpose, during the pre-investigation procedure, the police can:

- to request necessary notifications from citizens (but not in the capacity of accused, witness or expert);
- to stop, legitimize and carry out the necessary examination or search of persons, means of transport and luggage, if there are grounds for suspicion that traces of the crime or objects that can serve as evidence will be found with them;
- to divert, direct or limit the movement of persons and means of transport in a certain area for the necessary time (up to 6 hours);
- to take necessary measures in order to determine the identity of persons and objects;
- to take fingerprints, sample for DNA analysis and take photographs;
- to conduct a search, issue a warrant for the person and an announcement for the property and property benefit or for the objects that are being searched for;
- to inspect certain facilities and premises of state authorities, institutions exercising public powers and other legal entities and to inspect certain of their documentation;
- to perform recognition;
- to undertake other necessary measures and actions.

It is the duty of the police to notify the public prosecutor without delay of the criminal charges submitted to them or the information received about crimes for which the prosecution is undertaken ex officio.

The Financial Police Authority has the powers given to the judicial police in cases where it is about detection and investigation of criminal acts:

- money laundering and other criminal proceeds;
- illicit trade;
- smuggling and tax evasion;
- other crimes with illegal property benefit of significant value.

The Customs Administration has the powers given to the judicial police by the Law on Criminal Procedure in cases where it is about detection and investigation of crimes:

- production and placing on the market of harmful means for treatment;
- production and marketing of harmful food products;
- unauthorized production and marketing of narcotic drugs, psychotropic substances and precursors;
- unauthorized acquisition and disposal of nuclear substances and introduction of dangerous substances into the country;
- taking out, i.e., exporting goods under temporary protection or cultural heritage or natural rarity abroad;
- money laundering and other proceeds;
- smuggling;
- customs fraud;
- concealment of goods subject to smuggling;
- illegal possession of weapons and explosive substances;
- human trafficking.

For the purpose of checking the allegations in a criminal report or checking knowledge of a committed crime, the Public Prosecutor can collect reports himself, but usually issues orders and directions to the police and other discovery authorities, requests evidence, information, reports and data, etc. (Kalajdjiev, 2019: 13)

The investigative procedure is carried out by the public prosecutor and the judicial police are available here, when taking some of the actions such as:

- search;
- temporary securing and confiscation of objects or property;
- examination of the suspect;
- questioning of witnesses;
- expert determination;
- inspection and reconstruction;
- special investigative measures.



### 3. ANALYSIS OF THE POLICE LAW

According to Article 11 of the Police Law, the police cooperates with citizens, state authorities, citizens' associations and other legal entities for the purpose of preventing or detecting crimes and misdemeanors. (Official Gazette of RNM, Article 10)

According to Article 10 of the same law, the police, upon request, provides citizens with information, notices, data on issues within their scope of work in which they are interested and which information is permitted. (Official Gazette of RNM, Article 10)

The police is organized according to the principle of "community policing", which enables the establishment of relations between the police and the public, and thus effective cooperation with other state authorities, local self-government units, citizens' associations and the citizens.

The police officer collects information in direct conversations with citizens regarding criminal offences when there are grounds for suspicion that a criminal offence is being prepared, in progress, or has been committed, and there is a well-founded belief that the citizen has knowledge of circumstances related to that criminal offence. The citizen is not obliged to provide the requested information to the police officer.

The main feature of democratic policing is the idea that police activities are carried out with the consent of the people. Since the police cannot assume that they always act in accordance with all citizens, they must ensure that citizens approve of their actions. Transparency in police operations, communication and mutual understanding between the police and citizens is a prerequisite for receiving support from citizens.

Measures to achieve transparency and communication include:

- public distribution of reports on crime and police operations;
- introduction of mechanisms so that citizens can request services from the police;
- creation of forums for open discussions on crime and security problems;
- introducing community policing.

#### **4. CONCLUSION**

Crime in society is a negative and dangerous phenomenon, and to fight against it, there must be coordinated police cooperation. Police cooperation represents joint action of the police with institutions, bodies, citizens and foreign police services. At the state level, the police usually cooperate with the criminal prosecution authorities, that is, with the Public Prosecutor's Office. Such cooperation comes to the fore mostly in the pre-investigation procedure, where the police work under the orders of the public prosecutor, while following the orders of the public prosecutor while maintaining a certain authority. In that context, the police proved to be extremely important, especially when conducting police investigations. We can conclude that the police has a significant and irreplaceable role in the detection, prevention and prevention of criminal acts, which requires cooperation between the police and the institutions during the criminal procedure. As we can conclude, the Police during the criminal procedure has the greatest cooperation with the law enforcement authorities, that is, with the Public Prosecutor's Office. Such cooperation comes to the fore mostly in the pre-investigation procedure, where the police work under the orders of the public prosecutor, while following the orders of the public prosecutor while maintaining a certain authority. In that context, the police proved to be extremely important, especially when conducting police investigations.

As we can conclude, the police has a significant and irreplaceable role in the detection, prevention and prevention of criminal acts, which requires cooperation between the police and the institutions.

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