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РЕФОРМИ НА БЕЗБЕДНОСНИОТ СИСТЕМ КАКО ПРЕДУСЛОВ ЗА ЕВРО - АТЛАНТСКИ ИНТЕГРАЦИИ

INTERNATIONAL SCIENTIFIC CONFERENCE

SECURITY SYSTEM REFORMS AS PRECONDITION FOR EURO-ATLANTIC INTEGRATIONS

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PREFACE

The mission of the international scientific conference is to encourage the academic community and practitioners in the security sector to share knowledge based on the application of subject specific research scientific methods and upgrade the practical experience with a scientific – research dimension. The idea for organizing this Conference coincides with the need for essential reforms of the security sector in the Republic of Macedonia.

The papers received by means of a public announcement offer solutions for the future establishment and renaming of the security system in order to respond efficiently to the contemporary security risks and threats, that is, the destabilizing factors that create conflicts.

On that note and in correlation with the Conference title, the rational assumption for full application of the required reforms in the security sector presented in the papers that treat security issues in a number of sub-disciplines of the science of security, confirms the existing and encourages the creation of new solutions within the security system, based on a holistic approach in view of efficient and timely dealing with security risks and threats and accelerating the Euro – Atlantic integration process.

Hence, the mission of the conference is to stimulate scientific workers to exchange views and knowledge of the science that should identify the security needs and determine the security reforms and opt for an appropriate security concept, as one of the prerequisites for Euro – Atlantic integration of the country.

The practical goal of the topic of Conference Compendium is multifaceted, primarily due to the scarce number of papers and analyses on this topic in scientific and expert literature and the partial scientific approach in those that exist, which implies imposing effects in practice. The Conference and the Compendium aim to produce valid results and scientifically verified knowledge that will enable the implementation of a rational and acceptable solution for the security sector reforms. Argumentative substantiation and presentation of the derived results and the overall situation are used to consider the systemic and institutional solutions and to initiate a new phase of qualitative development of the security system and its institutions.

Security sector reforms aim to provide an efficient security system with appropriate security capacities to deal with potential threats. Hence, security sector reforms contribute not only to a more efficient security apparatus, but also to a more responsible one.

The overall goal of the "security sector reform" is directed toward transformation of the security institutions so that they acquire an efficient, legitimate and democratically responsible role in ensuring the external and internal security of its citizens. The work invested in these reforms is expected to yield certain positive effects that will be felt primarily by the state itself, and then by its citizens. In terms of the effects or the implications that may arise in the process, they should be grouped in two segments; positive and negative effects.

Positive effects mean increased internal and external security, greater and increased investment process, higher level of employment, greater mobility of population

and capital, offering more possibilities to the citizens and a wider choice of living conditions, receiving assistance from European development funds, assistance in the defence sector, modernization, development and all other areas on which the progress of the security sector is dependent.

The positive effects also concern the citizens directly, in terms of respect of human rights, the rule of law, equitable and ethnic representation in the security structures, improved living and working conditions, participation in different peace missions, requesting certain competences for executing the assigned tasks, control over the work – external and internal, assessment, ensuring a quality system, increasing the services for the citizens and their quality, more stringent criteria for non-legal conduct, etc. What is more important, considerable progress has been made in increasing the communication of the security structures regionally and internationally and developing their cooperation within international security organizations, which has resulted in positive effects in conducting major actions against international crime covering trafficking in drugs, weapons, people, radio-active materials, etc.

On the opposite side, there are also negative effects of the reforms: downsizing of employees, losing some privileges, decreasing competences, jurisdictions and the possibilities for fight against crime.

It is evident that there is a global process of continuous changes of the security threats worldwide, which calls for transcending the local needs of the security structures and stimulating them to think and act globally.

The papers in the Compendium and the Conference cover the following topics:

- The relation between external threats and internal weaknesses as the basis for security reforms
- Civilian and democratic control of the security system
- Transformation of the secret (intelligence and counterintelligence) services
- The role of the police and the Army in the crisis management and protection and rescue system
- Restructuring of the security system to enable dealing with contemporary threats, terrorism and organized crime
- Coordination and reorganization of the security institutions
- Regional security cooperation as an imperative for Euro – Atlantic integration
- Prevention against internal risks and asymmetric threats
- The role of non-state actors (private security, civic organizations, the media) in the security system and its reshaping;

The Faculty of Security – Skopje has a key role in promoting the security system. Moreover, it aims to increase the security and stability in the Republic of Macedonia by learning, creating professional personnel, conducting research and implementing the best practices in the security sector reform process in the country.

Thus, the Faculty of Security – Skopje continues its orientation toward organizing international conferences in the security field in order to contribute to the development of scientific thought, and help policy creators (political level) and decision makers (senior practitioners) on the regional, national and local level to overcome the practical problems they are facing in a faster, simpler and timely fashion with the acquired knowledge and research results.

I believe that the next 10th jubilee will crown the successful joint project of the Faculty of Security – Skopje that is a combination of experience and youth of this higher educational institution, stimulating its greater development in future into one of the most important security academic fora of South Eastern Europe.

Chairman of the Organizational Board
of the International Scientific Conference and Vice Dean for Science and
Development at the Faculty of Security – Skopje
Assistant Professor Marjan Gjurovski, Ph.D

Country	Original scientific paper	Review scientific paper	Professional paper	Total work papers
Bulgaria		2		2
Bosnia and Hercegovina		5	1	6
Croatia		2		2
Dubai		1		1
Kosovo		1		1
Macedonia	8	30	14	52
Serbia		13	1	14
Slovenia		1		1
Turkey	1	1	1	3
United Kingdom		1		1
Total work papers	9	57	17	83

CRIMINALISTIC SCIENCES

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VALIDITY OF POLYGRAPH EXAMINATION IN CRIMINAL INVESTIGATIONS

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Abstract

Although the polygraph examination has been consistently used in criminal investigations for more than half of a century with the aim of verifying allegations of the suspect, eliminating innocent persons and identifying the perpetrators of criminal acts, the question of its validity is still being discussed within the scientific community. Namely, a considerable body of research on polygraph testing suggests that there is the impossibility of objective measurement of emotional reactivity in the real lying situation. At the same time, the research identified numerous problems concerning the insufficient control of the experimental situation, primarily the respondents' reactions, as well as the subjectivity of the examiner, the existence of non-coherence measurement, the lack of reliable physiological parameter in detecting deception and contamination due to the interaction of involved actors, etc. Furthermore, since classical measurements of emotional reactivity in lying conditions are performed by weighted measurements of several physiological parameters, most often cardiovascular, respiratory and electrodermal, studies also indicate that the same measures in single measurement often have unpredictable contributions. Therefore, such non-selective and uncontrolled reactivity prevents and significantly impedes the interpretation of the obtained reactions, that is, reliable detection of deception. Considering the previouslymentioned, the intention of this this paper is to summarize and discuss the key reasons which question the accuracy of the polygraph examination in detecting deception. Upon an adequate theoretical reflections and systematized presentation of research findings, we conclude that results obtained by polygraphic examination should be considered solely as an orientation-elimination indicator, instead of a guilt evidence when someone fails a polygraph test.

***Key words**: polygraph examination, criminal investigation, validity, deception detection*

1. INTRODUCTION

For more than half of a century, the polygraph has been consistently used in criminal investigations, with the aim of eliminating innocent persons and identifying the perpetrators of criminal offenses. However, over the last few decades, the researchers' interest in psychophysiological detection of deception has increased, in order to ensure

more reliable and efficient detection of lying, as well as solving a number of practical problems related to the impossibility of "objective" measurement of emotional reactivity in real lying situations. Regarding the attempts to make conclusions about deception by measuring emotional reactivity, researchers' efforts have been primarily directed towards increasing of the sensitivity of the existing instruments and development of new experiments using different test forms (Department of Defense Polygraph Institute, 2004). However, this did not essentially solve all the problems involved, especially those related to the subjectivity of the examiner in the process of presenting stimuli, controlling the reaction of the respondent, eliminating the ability of the examinee to respond to something other than the defined content of the test preference, presence of contamination due to the interaction of the involved actors, as well as the preference for the most reliable physiological parameter in measuring reactivity, if indeed present, and other issues.

It must be acknowledged that the issue of polygraph validity is still a subject of scientific debate, especially in the United States, and this trend will probably continue, bearing in mind that the essential problem is actually designing and implementing a scientifically acceptable research that would ensure scientific validity of polygraph testing. Although scientific research on the polygraph testing has not progressed over time (National Research Council, 2003), some efforts have been made to develop and apply new approaches, and they imply certain solutions in terms of psychophysical stimulation of the examinees, and at the same time fixation and analysis of the obtained physiological signals.

Bearing in mind the importance of establishing the validity of polygraph testing, the intention of this article is to provide insights into this complex issue. Having consulted a number of scientific research findings on polygraph testing, we tried to summarize and explain the key reasons that question the validity of the polygraph examination in determining deception. We begin by discussing the issue of emotional reactivity in lying conditions, and then we describe the use and limitations of Concealed Information Test and the Control Question Test, which are most commonly used in the polygraphic testing. Finally, we discuss certain factors that may affect polygraph validity, such as subjectivity, experience and skills of the polygraph examiner; gender, intelligence, motivation and autonomic lability of the examinee; countermeasures, etc. We conclude that there is very little scientific evidence for validity of polygraph testing.

2. EXAMINING EMOTIONAL REACTIVITY IN LYING CONDITIONS

Although a polygraph is sometimes marked as a lie detector, this term is misleading, since polygraph does not detect lies directly but rather measures psychological responses or physiological reactions that may be related to lying (Grubin & Madsen, 2005). The use of polygraph testing is based on the assumption that emotional reactivity in lying conditions is most optimally manifested through certain physiological reactions, which polygraph detects as signs of autonomic nervous system excitement (Vrij, 2000). The instrument measures changes in conductivity and skin resistance, blood pressure, heart rate and respiration. It detects even small sensory differences that are distributed on different parts of the body (Ben-Shakhar, 2012; Gamer, 2011; Matte, 1998; Menders, 2009; Vrij, 2008). Each of these physiological reactions, whether they are electrodermal, cardiovascular or respiratory, cannot be measured separately with great confidence in the context of deception, which indicates their individual shortcomings. Namely, blood pressure, pulse and heart rate are not sufficiently discriminatory to distinguish people who

lie from those who speak the truth (Podlesny & Raskin, 1977; Feld, Specht, & Gamer, 2010). Breathing is under the influence of the central and autonomic nervous system, which implies that the steady rhythm of breathing can be consciously influenced (Gamer, 2011). Unlike cardiovascular and respiratory measures, numerous studies show predictive value of electrodermal measures, especially in situations where the subject is lying (Ben-Shakhar, 1994; Gamer, 2011; Gronau, Ben-Shakhar, & Cohen, 2005; Horvath, 1978; Verschuere & Ben-Shakhar, 2011). Thus, a series of studies confirmed that the electrodermal activity which is under the influence of the sympathetic system is consistently changing proportionally to the change in emotional intensity (Bradley & Lang, 2007; Mendes, 2009; Sato & Iwasaki, 2013); that is, the electrodermal reactions increase when the level of excitement increases. These results indicate that cardiovascular and respiratory measures are less efficient than electrodermal measures (Bell, Kircher, Bernhardt, 2008; Gronau et al., 2005), and that electrodermal measurements may be the standard for the psychophysical parameter of examining lies (Ben-Shakhar & Elaad, 2003; Gronau, Ben-Shakhar, &Cohen, 2005; Vrij, 2008; Gamer; 2011; Verschuere & Ben-Shakhar, 2011; Sato & Iwasaki, 2013). In addition to the individual deficiencies of cardiovascular or respiratory reactions, it is important to point to another problem related to these reactions, and that is the existence of distinct individual differences in the so-called physiological answers of the respondents (Farrow, Reilly, Rahman, Herford, Woodruff, & Spence, 2003; Mardaga, Laloyaux, & Hansenne, 2006; Ben-Shakhar, 2012). Thus, there are no entirely reliable signs of emotional arousal, nor there are signs that all respondents display (Ekman, 2001). Namely, the persistence of individual differences is related to the level of autonomy. Although there is a significant variation in individual responses to most physiological measurements, electrodermal lability may be different, which is of crucial importance for understanding this reaction (Waid & Orne, 1981).

3. VALIDITY OF THE CONCEALED INFORMATION TEST (CIT)

Critics referring to the polygraph use include those aspects of its application which relate to certain polygraphic procedures or polygraph techniques that can be divided into two groups (Ben-Shakhar, 2012). The first group represents techniques that are based on the analysis of physiological reactions to direct questions, while the second group represents techniques based on the identification of hidden information or remembrance. The typical method from the first group is Comparison Question Test (CQT), also known as the Control Question Test, while Concealed Information Test (also known as the Guilty Knowledge Test -GKT) is most popular within the second group. Since these tests are commonly used in practice, the following section deals with the question of their validity (accuracy).

The Concealed Information Test is used in criminal investigations when determining whether a suspect recognizes information related to a criminal offense. During the test, the polygraphic examiner presents several stimuli to the person being tested, such as photos, answers to questions and sketches, where only one of them is related to the crime. Stimuli must be chosen in a way that innocent persons (uninformed) do not see any difference between relevant and irrelevant stimuli, which means that they should react to all stimuli in the same way (Baić & Areh, 2015). The number of questions in the test depends on the number of possible alternatives for the specific subject matter, but should not be less than five (Matte, 1998; Ben-Shakhar, 2012; National Research Council, 2003; Vrij, 2008;). Physiological responses to stimuli are measured during testing, and if there is

no difference in the responses to the relevant and irrelevant stimulus, then it is concluded that the suspect does not recognize the relevant (critical) stimulus. If there is a difference in reactions, it is concluded that the suspect has recognized a critical stimulus, which may mean that he was involved in the crime, or that he knew the details of the crime (Verschuere & Ben-Shakhar, 2011; Osugi, 2011; Ben -Shakhar, 2012).

The whole test situation by itself is a kind of stimulus, with a pronounced emotional charge that the examinee perceives as a danger, regardless of whether he tries or does not try to hide the knowledge of the information which are the matter of polygraph examination (Mijović, 2017). Therefore, due to every detail of the test situation, examinees have considerably increased level of excitement and attention. At the time of initiation of verbal stimulation, the sound turns into a nerve impulse and causes the reaction to begin (Guyton & Hall, 2008).This state of elevated excitement is the basis for the reaction to any test stimuli (Öhman, 1993; Mogg & Bradley, 1999; Lang, Bradley, & Cuthbert, 1998; Staal, 2004; Verschuere & Ben-Shakhar, 2011), which is a problem, since the first test reaction of examinee who conceals information in a real lying situation is higher by all parameters than the reaction to a relevant stimuli (Horvath, 1994; Verschuere & Ben-Shakhar, 2011). On the other hand, the absence of a reaction can occur with an insufficiently excited examinee, as well as with a too excited examinee, because the focus of attention is narrowing due to stress, which is why some important features will be outside the spectrum of the examinee's attention. An additional problem is the fact that a visual stimuli with emotional arousal content provokes the reaction itself, regardless of its relevance to the specific lie that is being investigated (Verschuere et al., 2001; Lang, Bradley, & Cuthbert, 2008; Drače, Efendić, Kusturica, & Landžo, 2013). Nevertheless, the limitations of the test can be manifested in other ways as well. For instance, investigator can only formulate questions if he knows the circumstances surrounding the criminal offense. However, there are many criminal investigations in which facts of the committed crime are unknown. Moreover, investigators are also "helpless" in rape cases when the suspect admits that there was sexual intercourse but claims it was voluntary. Similar problems also arise when several suspects admit that they were involved in the crime, but no one wants to fully confess (Raskin, 1988). Furthermore, serial perpetrators find it difficult to identify details that are related to a certain crime, which they have committed at some time (Nakayama, 2002). If a lot of time has passed since crime was committed, it is more likely that the perpetrator will forget some details regarding the crime (Honts, 2004). One of the issues that may also arise is that the information about the crime can be presented by the media, and therefore the possibility that the actual suspect as well as innocent persons were not aware of the details of the crime can not be discarded (Ekman, 2001).

When summarizing the results of numerous field and laboratory studies of polygraph testing, it can be concluded that most researchers report that the Concealed Information Test meets certain scientific criteria (Ben-Shakhar, 2012; National Research Council, 2003; The British Psychological Society, 1986, 2004; Vrij, 2008; Meijer & Verschuere, 2010; Verschuere & Meijer, 2014), but also indicate that there is a risk that the so called *false negative mistakes* may occur, meaning that the actual suspects may be mistakenly identified as innocent. On the other hand, the percentage of *false positive mistakes* (innocent suspects identified as guilty) is considerably lower, implying that CIT technique is more reliable for innocent persons, since there is a less chance of being mistakenly identified (Elaad, 1990; Elaad, Ginton, & Jungman, 1992).

4. VALIDITY OF COMPARATIVE QUESTIONS TEST (CQT)

By applying the Comparative Questions Test (CQT), examination begins with an interview that is performed prior to the testing. After a pretest interview, a number of questions are posed to the examinee, during which time the polygraph simultaneously captures the respondents' physiological and verbal reactions. Questionnaire is composed of relevant questions that directly relate to the essence of the committed crime, as well as of control questions that are used for comparison. Control questions are designed to cause a greater reaction to those who speak the truth. What is indicative of the CQT is that is based on the assumption that has no foothold in psychological or psychophysiological research, that is, control questions will generate more arousal than the relevant questions in the innocent suspect, and *vice versa* in the case of actual suspects (relevant questions will generate more arousal than the control questions) (Raskin & Honts, 2002). Therefore, it is difficult to imagine that someone who is innocent will have much stronger reactions to control questions which are not related to the crime in question, than responding to relevant questions. Lykken (1974) also directly contends the basic premise on which the CQT is based, which actually determines the entire test procedure. Namely, he believes that most respondents are likely to be more "affected" by relevant questions than controlled questions, regardless of whether they give false or true answers to these questions, since the relevant questions are actually the only source of danger.

Thus, from the scientific perspective, there are many controversies regarding validity as well as the theoretical background of the CQT (Ben - Shakhar, 2002; The British Psychological Society, 2004; Lykken, 1998; National Research Council, 2003; Vrij, 2008). In the following section, we will try to summarize a few more issues regarding the application of this test. First, the CQT is not standardized and objective, because the questions posed to the examinee depend primarily on the committed crime, as well as on the quality of the examiner's question development and administration of the CQT (Iacono, 2008). According to the report of National Research Council of the United States from 2003 (National Research Council, 2003), the theoretical background of the application of this test is problematic, since there is not strictly established difference between fear, anxiety or other emotional states that can be seen in the respondents' reactions to relevant or control questions. Secondly, the examiner intentionally misleads the examinee, because he is convincing him (her) that stronger physiological rresponses to control questions would mean deception, although the opposite is true. If a person responds more strongly to control questions than to relevant ones, the examiner concludes that the respondent is telling the truth (Vrij, 2008). Furthermore, if the suspect is too disturbed when answering the control questions, there is a risk that the real suspect's lies will not be properly detected. In such case, physiological responses to control questions are equivalent to relevant questions reactions, meaning that the results are not sufficiently convincing. However, if polygraph examiner misleads the examinee with certain control questions, there is a serious threat that the innocent suspect will be qualified as a liar. In that case, physiological responses to relevant questions could be stronger than reactions to control questions (Baić & Areh, 2015). Thirdly, the polygraph examiner tries to persuade the examinee that the polygraph is unmistakable, although the polygraph is far from an instrument that accurately determines deceptive behavior, especially due to the fact that there is no single physiological parameter indicating deception. This implies that under certain circumstances, honest respondents can display similar physiological patterns as dishonest ones, because they can become emotionally aroused when they know they are

suspects. Further, control questions raise another problem, which is the fact that the polygraph examiners are not sure if the answers to the control questions are truly honest (Lykken, 1998) For example, if the polygraph examiner uses control question such as *Did you take something that was not yours by age 25*? The respondent can answer with "No", and not really lie about it, because he may never really have taken anything or simply does not remember it.

5. DISCUSSION ON THE FACTORS INFLUENCING THE VALIDITY OF POLIGRAPH TESTING

In addition to the many factors that can affect the validity (accuracy) of polygraph examinations, as well as the overall measurement of emotional reactivity in case of lying, it is important to mention the role of the polygraph examiner in the test procedure. From a psychological point of view, the preparation of a polygraphic test is demanding and represents a significant deviation from the standardized test, as it depends not only on the examiner's experience but also on their skills (Lykken, 1998). The results of polygraph testing can be unconsciously influenced by polygraph examiners, that is, by their subjectivity, which is reflected in the uncontrolled introduction of their own subjective states into the testing process (Mijović, 1994; 2002). Furthermore, prior to the start of polygraph testing, the polygraph examiner can be convinced of the guilt of the examinee, which may influence the ultimate outcome of the testing (Elaad, Ginton, & Ben-Shakhar, 1994). This happens when the examiner knows the examinee from before, namely his criminal biography. If the polygraph examiner is sure in the innocence of the examinee, he can "exert more pressure" by asking control questions, thereby increasing the likelihood of his innocence. However, if he is convinced of his guilt, he may not emphasize the control questions enough, and thus increase the likelihood that the respondent will "fail" the test. In this way, the results of the polygraph testing reflect the examiner's belief in the guilt of the examinee, which indicates that the test is not as objective as some advocate (National Research Council, 2003; Vrij 2008). The emotional aspect of the examiner's behavior (suggestiveness, expectations, suspicion, mood, etc.) can be unconsciously embedded in the current, irreplaceable way of verbal appeal of stimuli, through more or less subtle intonation, accent, emphasis on individual letters, syllables, words or entire parts of the stimulus (Mijović, 1994, 2002). This non-selective and uncontrolled reactivity, besides complicating and sometimes impeding the interpretation of the obtained reactions, also leads to emphasizing the subjective factor in measuring reactivity during lying (Mijović, 1994; Vrij, 2000; Ekman, 2001). Thus, the ultimate conclusion is that the subjective factors cannot be easily expressed, without affecting the objectivity of the measurements.

Furthermore, another problem that can be encountered during the polygraph examination is the possibility of using the so-called "countermeasures", which are the intentional techniques that can be used by examinees during testing in order to beat the polygraph and prove their innocence, and thus mislead the examiner regarding the final outcome of the polygraphic testing (Gudjonsson, 1983; 1988; Verschuere et al., 2011; Ben-Shakhar, 2012). Gudjonsson (1988) describes that countermeasures can be at the mental level, and they represent attempts of examinee to suppress physiological responses to the relevant questions, through activities such as: relaxation, meditation, self-distraction**,** recollection of exciting emotional memories, so that the difference in the response between the relevant and control questions is minimal. These mental activities are carried out during the presentation of a neutral, that is, irrelevant or control stimulus. Further,

countermeasures can also be attempts to reduce overall anxiety or reactivity, or reduce physiological response, which is particularly related to relevant questions (e.g. using some kind of medication to calm down before testing). Finally, according to Gudjonsson (1988), countermeasures include attmpts to increase physiological responses to control or neutral questions, in order to reduce the difference between relevant and control questions. This can be achieved by inflicting physical or mental pain (e.g. tweaking, biting the tongue) or creating a muscle tension when the irrelevant or control stimulus is presented.The use ofmental and physical countermeasures can be very effective, because it is simply impossible to prevent them. And while some authors report that the spontaneous use of countermeasures has been found to be ineffective against the CQT (Honts, Raskin, Kircher, & Hodes, 1988; cit. in Honts, Raskin, & Kircher, 1994, p. 252), otherresearch has shown that training in simple physical maneuvers (e.g. biting the tongue or pressing the toes to the floor) can be ffective in defeating polygraph tests by enhancing physiological reactions to control questions (Honts et al., 1994, p. 252). Moreover, the results of the study conducted by Honts, Raskin, & Kircher (1994) strongly suggest that control question polygraph tests may be defeated by guilty subjects trained in the use of physical or mental countermeasures. Finally, some authors indicate that mental countermeasures are usually more difficult to detect than physical (Ben-Shakhar & Dolev, 1996; Gronau, Elber, Satran, Breska, & Ben-Shakhar, 2015).

The existing literature also indicates other factors that may affect polygraph validity. Namely, differential validity in polygraph testing may depend not only on the subjectivity of the polygraph examiner, his skills and experience, but also on the person being examined (its gender, intelligence, motivation, and autonomic lability). Certain categories of people do not respond to polygraph testing, such as psychopaths, mental patients, persons under the influence of narcotic drugs, alcohol and certain types of medication, persons in a stressful state, etc. (Deljkić, 2016). For instance, it is evident that psychopaths have an exceptional ability to conceal the emotions they experience. In addition, when compared to normal population, psychopaths are much less burdened with punishment (lack of guilt, guilty conscience) (Lykken, 1998). Therefore, there is a high likelihood of the wrong finding of the polygraph examiner, because there is no difference in physiological responses between control and relevant questions (Porter & Woodworth, 2007). Further, it is assumed that men and women may have different patterns of autonomic excitement that may affect the validity of polygraph testing. Also, the ability of intelligent subjects to anticipate questions that can affect the accuracy of polygraph testing, as well as to better understand the meaning of polygraph testing will make them answer the relevant questions with greater arousal in order to deceive a polygraph examiner. In the case of motivation, an examinee who is motivated not to be caught in a lie, directs his behavior precisely in order to avoid responsibility. Elaad and Ben-Shakhar (1989) have noticed a greater difference in theorientational reaction between signal and neutral stimuli under high motivation conditions than under low motivation conditions, despite the same classification data that existed for all stimuli and all the respondents. The last individual difference which Waid & Orne (1981) denote as the concept of autonomous lability, indicates that there are individual differences in autonomous responses.

6. CONCLUSION

It is very difficult to answer the question of how accurate the polygraph testing is, since there is very little scientific evidence of its accuracy. Although, much research has been conducted in the field of polygraph testing, the quality of most studies to date is low and does not meet the scientific standards, which implies that there is no solid scientific evidence that confirms the validity of the polygraph testing. In that sense, it is justified not to make a conclusion whether the suspect is lying or telling the truth only on the basis of the polygraph examination results. Results of the polygraph testing should be considered exclusively as an indicator that someone may be lying, and not the evidence of the suspect's guilt if failed testing.

Serbian literature refers to the method of adaptive stimulation as a new solution for the psychophysiological stimulation of the respondents and the analysis of reactions obtained by recording electro-dermal or other physiological signals (Ranđelović, 2016; Mijović, 2017). The method is based on the idea to bring the respondent to a specific psychological state by using a short-term sound and / or visual stimulus that lasts for a very short time. After this, a relevant question is presented to the examinee and the electro-dermal reaction is analyzed. What is emphasized as a novelty in comparison to the classical measurement of the physiological parameters of emotional reactions that accompany lying is a way of stimulating the examinees, as well as processing of the recorded physiological response, which is most commonly based on electro-dermal activity, but it is also possible to apply other physiological signals (HR-Heart Rate, EEG, etc.). Bearing in mind that this is a completely new method, more research is necessary in the future in order to provide evidence of its validity and possibility of application within criminal investigation.

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FORENSIC ROAD TRAFFIC ACCIDENT SCENE INVESTIGATION IN SERBIA – CASE STUDY

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Abstract

In the framework of its security system, the state is obliged to regulate the treatment of harmful events in order to provide protection to its citizens. Road traffic accidents are among the most numerous events, with the greatest overall consequences in many countries, and the need to regulate the treatment of these events is of great importance. The occurrence of road traffic accidents is explored in order to gather as much information as possible on the consequences and circumstances of the occurrence. The forensic scene investigation of traffic accidents depends on the severity of the consequences. Hence, the procedure is prescribed by a series of regulations (Criminal Procedure Code, Criminal Law, Offense Law, Road Traffic Safety Law) that cover all types of traffic accidents according to the severity of the consequences: with property damage only, with injured persons and with fatalities, or with the attributes of an offense or a criminal offense. This paper analyses the regulations in the field of conducting traffic accident scene investigation, with a particular reference to the internal regulation of the Ministry of Internal Affairs: Instructions for traffic accident scene securing and conducting traffic accident scene investigations, which further regulate the procedures for forensics scene investigation, overcoming thus the shortcomings that exist in the laws applicable in this area.

Keywords: *Forensics, Road Traffic Accident, Scene Investigation, Regulations, Criminal Procedure Code*

1. INTRODUCTION

Every state has the need to ensure the constitutional civil rights, and accordingly, the right to protect life, health and property. In order to satisfy all these rights, there must be a proper treatment of every harmful event. Road Traffic Accidents (RTAs) are among the most harmful events, and it is estimated that the consequences cost the states as much as 2-3% of GDP. Therefore, the actions on RTA are regulated to a high extent in the Republic of Serbia.

What will be regarded as a RTA in the Republic of Serbia is prescribed by the definition in the Road Traffic Safety Law[1] (RTSL), as follows: *A road traffic accident is an accident occurring on the road[2] or is commenced on the road, involving at least one vehicle on the move and in which at least one person has been killed or injured or only property damage has been caused* (RTSL, Article 7, paragraph 82). The main features of RTAs in the Republic of Serbia are (Lipovac et al., 2014):

- place of event ("on the road or commenced on the road"),
- participants ("at least one vehicle"),
- state of the participant ("on the move") and
- consequences ("at least one person was killed or injured, or only property damage has been caused").

According to the definition, the signs of a RTA do not include the guilt, the cause, the act of execution, the perpetrator, the element of surprise, the intent, etc.

2 PROCEDURES FOR ROAD TRAFFIC ACCIDENTS

The handling of RTAs in the Republic of Serbia is regulated by a set of regulations: the Road Traffic Safety Law, the Law on Police, the Law on Misdemeanors, the Criminal Code, the Criminal Procedure Code, and the internal acts of the Ministry of Internal Affairs (MIA).

From the aspect of the procedure, RTAs are divided in two groups: misdemeanors or criminal acts. RTAs as criminal acts are those in which at least one person has suffered bodily injuries regardless of their severity (light, heavy or fatal injuries) or property damage exceeding the amount of 200.000,00 RSD has occurred to a property of a larger scale (worth more than 850.000,00 RSD[3]). All other RTAs are qualified as misdemeanors.

There are different procedures for RTAs which qualify as misdemeanors and those that are qualified as criminal acts. They are as follows:

1. Incases of RTAs that are qualified as misdemeanors, there is no obligation on the part of the participants to report the RTA to the police, but there is a legal possibility if required. If the participants decide not to report a RTA, two possible actions may be undertaken:

   a) The participants have the opportunity to agree on the guilt and on the amount of property damage and consent to a financial compensation.

   b) The participants in a RTA can agree on the presence and location of the traces and objects of the accident, and initiate a regular procedure for insurance compensation (based on compulsory insurance), provided that they have previously (at the scene of the accident) filled in and signed the European RTA

[1]Official Gazette of RS", no. 41/2009, 53/2010, 101/2011, 32/2013 - decision of the Constitutional Court, 55/2014, 96/2015 - other law and 9/2016 - decision of the Constitutional Court

[2]Road is abuilt up, proclaimedarea that can be used as a traffic surface by all or certain traffic participants, under the conditions determined by law and other regulations. (Article 7, p. 2, Road Safety Law)

[3]Supreme Court of Serbia Decisions of 20 March 2002 and 27 March 2002.

Report. The compensation is paid to the injured/damaged party and the insurance premium of the insured who is guilty in the RTAis raised for the following year (bonus and malus system).

In both cases, the State will not prosecute a misdemeanor liability in order to avoid causing a lot of traffic congestions with so many events of this type and to avoid the costs of investigation and court proceedings, if they are not necessary. The law requires the participants to remove their vehicles, the traces and items of the RTA from the carriageway as soon as possible, thus enabling unobstructed traffic flow. Crime scene investigation (forensic scene investigation) is not performed.

When an RTA qualified as a misdemeanor has occurred, and at least one of the accident participants requests a crime scene investigation, the law stipulates the obligation of the police to come out to the RTA scene and perform an investigation, collect the prescribed data and initiate the appropriate misdemeanor procedure. Due to the need for conducting an investigation, it is necessary to secure the RTA scene. The costs for the RTA investigation shall be borne by the insurance company whose insurer has requested the investigation. These accidents are prosecuted by the misdemeanor court and initiated by the police.

2. In RTAs qualified as criminal offenses, the criminal court will prosecute the case and a crime scene investigation is mandatory. Due to the need for conducting an investigation, it is necessary to secure the RTA scene. The investigation is carried out by the prosecutor, with the technical assistance of the police.

Basically, upon an occurrence of RTA, and depending on the qualification of the traffic accident act as a misdemeanor or a criminal act, and the participants' agreement in the case of misdemeanor accidents, the tasks of securing the RTA scene and crime scene investigation (forensic scene investigation) are performed.

Securing the RTA scene *is a set of measures and activities that are undertaken in order to prevent the emergence of new casualties, provide emergency medical aid to the victims, preserve traces and objects of RTA, enable the traffic flow, etc.*

Crime scene investigation (forensic scene investigation) in case of RTA *is a system of actions in accordance with the provisions of the law, aimed at finding objects, traces and other circumstances significant for the clarification of RTA, professionally processing them and recording and preparing all the required crime scene investigation (Lipovac et al., 2014).*

The regulations on the procedures for traffic accidents regulate only the types of actions, but not the specific tasks and the manner of their implementation. Therefore, there was a need for additional regulation, which was implemented with an internal provision of the Ministry of Interior (MI) – *Mandatoryinstruction on RTA securing and scene investigation* (MI, 2007).

The Mandatory instruction deals with specific tasks, that is, the manner of treatment by police officers (and other employees of the Ministry of Internal Affairs) is regulated more closely within the process of organizing and performing measures and tasks for securing the scene of the RTA and carrying out the crime scene investigation in the Republic of Serbia. The Mandatory instruction regulates the treatment in such a way that the implementation of the subject matter is in accordance with the regulations and the professional and scientific rules, as well as the technical and human resources. On that

note, the Manual "POLICE PROCESSING OF ROAD TRAFFIC ACCIDENTS – Securing the scene and carrying out the crime scene investigation" (Lipovac et al., 2007) is also used as the accompanying document which clarifies additionally the Mandatory instruction.

In prescribing the crime scene investigation of RTAs, the Mandatory Instruction makes a distinction between RTA with criminal or misdemeanor liabilities, taking into account the possibility of an agreement between the participants in case of RTAs qualified as misdemeanors.

2.1 Securing the traffic accident scene

Securing the traffic accident scene is an activity prescribed by law and its specific aspects are implemented for all types of RTAs (in terms of severity of consequences). Upon arrival at the RTA site, the first activities are aimed at securing the accident scene. Security is provided as long as necessary, or until the end of the scene investigation.

The mandatory instruction stipulates that, in securing the accident scene, a police officer, inter alia, is obliged to:

a) *take actions to prevent the emergence of subsequent (secondary) RTAs, within the available resources and equipment;*
b) *provide first aid and organize transportation of the injured to the nearest health institution;*
c) *provide access to the RTA site in order to enable emergency care of the injured persons, fire extinguishing and performing other urgent tasks;*
d) *determines the area of RTA scene, i.e. establishes an "internal*[4] *and external*[5] *blockade", by placing the temporary traffic signs and equipment;*
e) *take measures to preserve the RTA scene, traces and objects unchanged;*
f) *take measures to prevent unnecessarily interruption of traffic flow;*
g) *at the RTAsqualified as misdemeanours for which scene investigation is being conducted, mark the position of the vehicle and important traces before the vehicle and objects from the RTAs are moved, and if there are technical possibilities, take photographs;*
h) *identify the participants and witnesses, secure them, separate them and prevent their communication;*
i) *in the case of "hit and run" RTAs, collect information and data and inform the Duty Service;*
j) *urgently inform the Duty Service about new knowledge related to the RTA, and especially about RTAs with serious consequences, with a fugitive participant, when state officials or persons with parliamentary, diplomatic or other immunity have participated in the RTA, as well as Ministry vehicles, police officers, military vehicles, foreign citizens and in cases of possible hazards;*

[4]Internal blockade includes the smallest area where traces and objects are present. In this area no personsare allowed, except for the necessary members of the investigation team. The appearance of the crime scene may be changed due to the performance of the necessary task, for example, first aid to injured, fire extinguishing, etc.

[5]External blockadeincludes a wider area than an internal blockade, with the aim of increasing safety of the investigation team. In the covered area, RTA participants, passengers and eyewitnesses, tow trucks, auto-cranes, first aid vehiclesetc., are retained.

k) in the event of bad weather conditions, find and secure objects and traces of the RTA from displacement, damage or destruction, and if there are technical possibilities, take photographs;
l) take photographs[6] if there is knowledge that the crime scene investigation will begin at night;
m) prevent unauthorized persons from entering the premises of the external blockade, or removing them from the area;
n) take measures to prevent and eliminate the danger of inflammable, explosive and other substances;
o) in case of fire or explosion, urgently inform the Duty Service and, if possible, organize rescue and fire fighting;
p) undertake measures to secure the vehicles, cargo (goods) and other items of possible theft and spoilage;
q) cover and secure bodies of dead persons;
r) take measures to clear the road and, if necessary, request roads maintenance companies or other enterprises or persons to do so, if the driver, owner or user of the damaged vehicle, cargo, other objects or bulk material is not able to do so;
s) take other measures and actions at the request of the crime scene investigation manager, or independently (send the vehicle to the technical inspection and/or the forensicscene investigation, organize the transport of the dead personsbodies, etc.);
t) inform the crime scene investigation manager on the collected data, undertaken measures and possible changes on the spot;
u) take measures to normalize the traffic flow after the completion of the crime scene investigation;

Of particular importance is the provision that for RTAs qualified as criminal offenses, a Report on crime scene security is filled in. In the Report, the police officer records important data, chronologically from obtaining the first information until the completion of all activities related to a particular RTA. It is stipulated that a copy of this Report shall be a part of the crime scene investigation documentation.

The contents of the Report on crime scene security includes,inter alia:

- Whether there was a traffic flow and RTA scene security until the arrival of the patrol officer (description of the traffic, who performed the crime scene security and how, according to whose testimony);
- Changes at the RTA site until the arrival of the patrol officer (description, reasons, according to whose testimony);
- Way of care for the injured persons and dead bodies (which persons, who provided care, how, where and who transports the injured);
- RTA participants and eyewitnesses found on site (basic personal data);
- Any modification of the crime scene by the patrol officers (which objects, why);

[6] If there are technical conditions.

These is important information that relates to possible changes at the crime scene, which can be critical to the outcome of the RTA analysis.

2.2 Forensic road traffic accident scene investigation (and documenting)

Forensic RTA scene investigation is carried out using the following methods: exclusion, photography and video recording, graphic and verbal method. When applying any of them, the most recent technical equipment available to forensics is used.

3.1 Method of exclusion

The method of exclusion is a process of finding, expert processing, transporting and storage of traces (or samples), items and objects for further analysis.

3.1 Method of photography and video recording

According to the methodology of photography described in the Manual (Lipovac et al., 2007), photo-documentation (as a product of the method of photography) consists of the following groups of photographs:

- wider (further) perspective of the scene, from all directions to the accidentsite;
- narrower (closer) perspective of the scene, from all directions to the accidentsite;
- mutual positions of vehicles, traces and objects of a RTA;
- the look of traces and objects individually;
- the look of vehicles and objects (especially damages and other traces on the vehicle);
- the look of dead bodies of persons and animals;
- other important details (eg, completing the exclusion process, important details on the road and objects, etc.).

There is also recommendation in the Manual that the photographs should be taken in the maximum resolution of the camera (digital), in order to allow subsequent analyzes by zooming in the details in the photos.

3.2 Graphic method

The graphic method involves drawing up a sketch and a situation plan.

The Sketch is a freehand drawing of the RTA scene, that is made at the scene, which contains all measures taken at the scene. The completed sketch is scanned (in high resolution - 600 DPI) and becomes part of the electronic (digital) scene investigation documentation, while the original sketch is attached to the classic documentation.

The Situation Plan is a scale drawing, which contains only the most important measures. It is drawn by a sketch, classically (using drawing accessories) or using one of the computer drawing programs. In case when it is classically drawn, the Situation Plan is scanned (as well as the sketch) and stored as a part of the digital documentation, while in case it is drawn by a computer,it is stored in its original form,and printed and attached to the classic documentation.

3.3 Verbal method

When performing tasks during scene investigation, a description of the most important elements at the scene is briefly written, and if there are technical conditions a voice recorder will be used. This sound record will be stored in digital form and attached to the scene investigation documentation. Later, based on notes or soundtracks, the RTA scene investigation report is written (in the text processor), and stored in digital form (as element of digital documentation), and printed for the classical documentation.

3.4 Determination of location

It is anticipated that the RTA site is determined by using a GPS device. When measuring the position, the approximate location of the collision (or the place where the vehicle left the roadway in single vehicle accidents) should be taken as the RTA location. Coordinates (x, y) and the accuracy of the measurement should be read and entered in the sketch and in the RTA scene investigation report.

3.5 Completion of scene investigation documentation and archiving

The Instruction (MUP, 2007) stipulates the content of the scene investigation documentation. When the RTA is qualified as a criminal offense, the documentation will contain:

a)criminal charge or report to a prosecutor;
b) compulsory elements of the investigation documentation:
- Scene investigation report,
- Sketch,
- Situation plan,
- Photo-documentation,
- Report on crime scene security.

c) other elements that are significant for consideration and clarification of the RTA, which can be provided:
- video recordings,
- record of hearing the suspect;
- statements by RTAs participants;
- statements of witnesses;
- an official note on the information received from citizens;
- a decision on arresting, detaining or escorting a person;
- receipt of temporarily seized objects;
- record of the performed police control of traffic participants-vehicles;
- findings about the presence and concentration of alcohol, narcotics or drugs that are marked not to have been used before and during driving, of the driver or other accident participants, issued by the competent authorities;
- a report on the registered property and a receipt of the transferred property;
- an official note of excluded items and traces;
- report or notice, or other medical document on personal injuries;
- confirmation of the death of a person;
- reports on technical and forensic inspection of the vehicles;
- receiptof the temporarily seized driver's license, traffic license or registration plate, a tachograph insert or tachograph device, and

- other documents important for the RTAs clarification.

In case of RTA qualified as a misdemeanour, the documentation will contain:

a)request for the initiation of a misdemeanor procedure;

b) compulsory elements of the investigation documentation:

- Scene investigation report,
- Sketch and/or Situation plan.

c) other elements that are significant for consideration and clarification of the RTA, which can be provided:

- photo documentation,
- record of the performed police control of traffic participants-vehicles;
- statements by the RTAs participants;
- statements of witnesses;
- an official note on information received from citizens;
- a decision on detaining a person;
- receipt of temporarily seized objects;
- findings about the presence and concentration of alcohol, narcotics or drugs that are marked not to have been used before and during driving, of the driver or other accident participants, issued by the competent authorities
- an official note of excluded items and traces;
- certificate of damage to a vehicle from other countries;
- reports on technical and forensic inspection of vehicles;
- receipt of temporarily seized driver's license, traffic license or registration plate, a tachograph insert or tachograph device, and
- report on crime scene security;
- other documents important for RTAs clarification.

Generally, when creating a court case file, digital technology will most likely be used originally, but it is possible to use analog technology in environments that do not yet have the appropriate digital equipment.

The digital crime scene investigation documentation is saved on a separate medium (CD, DVD, etc.) bearing the designation of the accident, and a copy of this media is submitted and stored in the police (in a police traffic accident file). Classical documentationis submitted to the prosecutor, and a copy is kept in the police (police traffic accident file).

The digital crime scene investigation documentation consists of all documents stored as digital files (sound and video records, reports and other text documents, digital photos and videos, digital drawings, etc.) or are digitized (scanned documents, scanned drawings, scanned photos, etc.).

In cases where digital technology (computer technology, digital photo and video technology) is used, archiving is provided in electronic and original form. This means that all photos should be preserved without any „previous“ interventions, which ensures that the set of information that follows each photo (EXIF[7]), contained in the file itself, provides unchanged information about: the brand and model of used camera, time and date of photography, resolution, compression rate, shooting parameters, focal length, flash usage,

[7] Exchangeable Image File Data

etc. Photographs made with a classic-analog camera are scanned directly from the negative, in a resolution of at least 5 Mpix (10 Mpix if there are technical capabilities). If there is no such negative scanning capability, analogue photographs should be scanned in color mode (even if the photos are black and white) and the 300DPI resolution, if a scanner is available. The tachograph insert should be scanned in resolution 1200DPI.

Digital video recordings will be compressed and archived electronically.

If analogue technology (pencil and paper, typewriter, etc.) is used, and there are digitizing technical conditions (scanner and computer), digitalization and archiving in electronic form will be performed. This, for example, refers to a sketch and a situation plan that is not drawn using a computer.

All archived documentationis kept in the police for at least 10 years.

4. CONCLUSION

The standardization of procedures for forensics scene investigationis related to a greater amount of quality information for RTAs analysis. Some of this information will be available at the very beginning of the analysis (as a regular content of the court case file), while in some situations it will be necessary to collect additional information and then conduct other necessary analysis. Having in mind that a particular activity must have been performed, certain "additional" data can be expected in advance. Typical examples are photographs: there ARE normally much more photos than it is needed for a photo documentation, and they can be subsequently delivered in a high resolution that allows significant magnification and detection of details that were not discovered during the investigation on the spot. Such examples can significantly influence the course of the analysis and the determination of guilt in the court proceedings. That is why RTA analysts should be familiar with the prescribed procedures during RTA scene investigation, and always aware that the archived material may contain some additional data of significance for the analysis.

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EQUIPMENT FOR FORENSIC ANALYSES OF WATER QUALITY

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Abstract

Pollution of waters in present conditions is a serious environment problem not only in the Republic of Macedonia but also in global frames. Especially in conditions of limited approach to natural recourses, water plays a significant role in creating healthy human environment, and it also represents the main factor or participant in the ecosystems. There is a big number of penalty crimes and misdemeanors of water pollution, which is why legislator incriminates behaviors which pollute drinking water, water for livestock and water for irrigation, etc.

Forensic examination of water and the equipment for forensic examination of waters are significant elements for detecting causes of polluted water, and this is the subject of interest of this scientific work. However, the authors of this paper analyze the situational expertise and the necessary equipment, and through forensic water expertise use instruments and equipment for the purpose of prevention, detecting and suppression of phenomena that lead to water pollution.

The survey was conducted with the aim of using the most accessible techniques, equipment, and instruments for forensic water examination, by measuring biological and physical-chemical parameters of water, as well as equipment for water sampling.

Key words: *water, pollution, forensic, equipment, instruments, etc.*

1. INTRODUCTION

Environmental criminality[8]represents a contemporary form of criminality, and as such it is characterized by a series of peculiarities. One of the most important is the massiveness in the figures that appear. The emergence of massive environmental crime is expressed in the statistics of the competent authorities, but when it comes to this issue, it is confirmed by a number of authorslike a "dark figure" of ecological crime. Since ecological

[8] Amidžić, M., Ćulum, D. & Petričević, V. (2014) *Definition, characteristics and causes of ecological criminality*,Proceedings of the International Scientific Conference: Suppression of criminality and European integration, with reference to ecological criminality. Trebinje: High School of Interior - Banja Luka. (p. 40).

crime has recently been a more pronounced type of crime, the authorities did not succeed in discovering this issue in time because the consequences are not manifested immediately.

In order to successfully fight against ecological crime, the need arises from an interdisciplinary approach in opposing and preventing it. It is necessary to study crime from all aspects, both in the phenomenological and in the etiological sense.

In doing so, all factors and influences which contribute to occurrence of ecological crimes and offenses should be considered. Namely, when studying ecological crime[9] and preparing a strategy for fighting it, it is necessary to conduct a full and comprehensive analysis of all emergent forms in order to successfully fight this type of crime.

Water, like other components of the natural environment (air and soil), represents a legal, but above all, social welfare which requires adequate legal protection. Accordingly, the meaning of water is provides for by taking of protective measures in the core of the criminal law. Within that framework, in the Republic of Macedonia water, in comparison to other ecosystems, is given the broadest criminal-legal protection.So far, the scattered and disorderly nature of ecological incriminations, according to the provisions from the old legal regulations has been overcome by the Criminal Code of the Republic of Macedonia since 1996 to a certain degree.

The methodology of detecting crimes[10] of ecological nature should take into account all the specifics of the crime related to environmental pollution and environmental crime at the same time. Activities should focus on gathering initial information and knowledge for the facts which show the existence of crime, and then detection, securing, and fixing of the traces for the crime and also securing other relevant material evidence.

In this paper we analyzed and studied forensic equipment for water quality analysis and the method of sampling, in order to achieve the optimal tasks for situational expertise, respectively prevention, detection, and suppression of phenomena that lead to water pollution.

2. CRIMINALISTIC TECHNICAL ASPECTS OF WATER POLLUTION

Pragmatically, the definition of criminalistics is that it is a science that finds, studies, and refines the scientific and through practical experienced grounded methods and tools which are best suited to discover and clarify crime, to discover the perpetrator and initiate for perpetrator prosecution under a criminal sanction, to provide and fix all evidence for determining the truth, as well as to prevent the execution of future planned and unplanned criminal acts[11].

Criminalistics is neither tactics alone, nor mere technique, nor methodology, but it is a unique *trichotomy*. In other words, it is the science of technique, tactics and methodology for operational, investigative and other judicial actions, as well as prevention of criminality.

[9] Sazdovska, M.M. (2007). *Environmental Criminalistics,*Skopje: Grafik Mak Print – Skopje (p.73)
[10] Latifi. V. (2014),*Criminalistics– detection and investigation ofcrime*,Prishtina: Faculty of Law - Prishtina (p.468)
[11] Vodinelic, V. (1995). *Criminalistic tacticsI*. Skopje: Nova Makedonija – Skopje (p 5).

Criminalistic technique or *natural scientific criminalistics* [12] represents a subsystem or part of a criminalist trichotomy. Criminalistics as one of the criminalistics sub-systems science represents a system of knowledge for studying and application of the most appropriate tools - methods from the field of natural and technical sciences, which uses, adapts, refines, or creates new similar methods for the needs of the criminal procedure as well as for detection, securing, and fixing traces and objects from the crime in order to detect and determinate the criminal offense and its perpetrator, and for prevention of criminalityin general.

Criminalistic theory points out that the *evidences* [13] represent an identified, established, relevant link between the processes, which directly or indirectly influenced the appearance of the crime, traces, objects, and persons. From gnoseological aspect, the evidences relate to all environmental changes for the preparation, commission, concealment, and enjoyment of the fruits of the crime, which are in an appropriate relationship with the act.

The field of criminalistic techniques covers that segment of criminalistics which belongs to the sphere of *material* or real occurrence in the *material world* that clarifies the *criminal enigma* including the optimal scientific methods, by which material objects are investigated or *silent witnesses* associated with the existence of a particular criminal event. The basic contribution and task of criminalistic technique consists in the fact that with the *material proof* as its undeniable *product* (as an unbiased proof for deciphering the objective laws and law making for the veracity and individual elements of the structure in the criminal event) it contributes to the objectification of the criminal procedure.

If we take into account the large range of criminal laws governing society, forensics in the broadest sense has become so comprehensive a topic, and the full processing of its role and techniques in one textbook is quite difficult, if not impossible. For this reason, we must find practical boundaries that narrow the domain of the subject. However, we will state the definition that is most commonly used and which is in the context of our subject of research: *Forensics is applying of the science in criminal and civil law that is implemented by police agencies in the system of criminal justice*[14].

Neither natural scientists nor forensic scientists start from theories or laws when facing the need to explain certain mysterious phenomena. They start from the data. Not from the general data, but from the unexpected anomalies that create the puzzles for which an explanation is required. Unusual observations suggest explanatory links for further consideration and testing. Such connections define the *evidence*[15] and distinguish data which represent evidence from data which are simply coincidental. In such an effort, the scientist of natural science and the forensic scientist share a fundamental approach, which is contrary to any simplified distinction between *real science* and *forensics*.

Forensic scientist or forensic experts are experts who can make certain observations using their knowledge, skills, and experience and on this basis, to pull and

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[12] Simonovic, B., Angeleski, M. &Stojanovski, D. (2009) *Criminalistic techniques*,Skopje: Official gazette of the Republic of Macedonia – Skopje (p. 17)

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make the best conclusions. The forensic expert should prepare the correct material, which they analyze and from which they bring conclusions, which are further used in the procedure (they will participate several times in the already prepared expert material[16]). This will be the case when for locating, selecting, and packaging expert materials a special expertise is required. The expertise represents a process form through which the idea of scientific evidence is directly realized and is of great importance in the procedure for detecting criminal acts of environmental pollution.With the performed expertise, in fact, at the same time it is conducted deciphering of the raw facts[17] and turning them into relevant and comprehensible content. Because it provides an answer to the question about the causes, the extent and the degree of pollution, the composition of the matter - pollutant, etc., the expertise provides the necessary assumptions for initiating and conducting the criminal procedure.

The material for the expertise must be submitted in due time, also respecting the principles of urgency. Otherwise, the expertise will not be possible because the material can be changed or destroyed. It is of the utmost importance that the material is submitted to the expertise in an unchanged form. This is especially important for the expertise of polluted waters, because when sampling is finished they should be taken for further expertise in laboratories in the shortest time possible, noting that during transport they should be provided and conserved properly, but also take care of the correct sampling so that wrong results would not be obtained, i.e. results by which it will not be possible to prove the crime in the waters.

3. FORENSICAL EQUIPMENT FOR SAMPLING, CONSERVATION, TRANSPORT AND LABORATORY ANALYSIS OF WATER QUALITY

When analyzing the quality of water, it is very important to take into consideration *the location*, *depth*, and *the number of samples*. If we want to find out the impact of the polluter, the samples should be taken at different distances from the "source of pollution".In lakes and different reservoirs where the time of the disembarkation (staying waters) of the waters is much greater than that of the flowing systems, the depth and number of samples should be taken into consideration in order to have a full picture of the impact of the pollutant.

The methods of taking a sample of water for analysis depend on:

- the goal that is to be achieved;
- the chemical nature of the substances to be analyzed;
- the nature of the water facility (drinking water from surface water, river water, lake water, underground water or waste water, or urban water).

[16]Vodinelic, V. (1978). *Criminalistics*,Belgrade: Savremena Administracija – Belgrade (p. 206)
[17] Sazdovska, M.M. (2007). *Environmental Criminalistic*,Skopje: Grafik Mak Print – Skopje (p. 153)

Imageno.1.Sampling at flowing watersor Rivers

Twinning project ENEA - Enforcing Environmental Acquis

Water sampling should meet the following conditions:

- to be an integral part of the aquatic facility or system being analyzed;
- not to be contaminated during operation;
- not to compromise or contaminate reagents while handling;
- not to use non-calibrated instruments during the site sampling;
- avoidance of the change of the sample during conservation and transport.

The sampling can be manual or automatic (image no. 2.)

Imageno.2.Automatic mobile sampling device

https://www.watersam.com/en/automated-samplers-and-monitoring-stations/

Equipment for analyzing parameters which are significant due to urgency and can be made on the site as: temperature, pH, turbidity, electrical conductivity, and dissolved oxygen can be made with individual sensors for each parameter as well as multiparameter sensors (Image. no. 3).

Image.no.3. Automatic mobile sampling device

Twinning project ENEA-Enforcing Environmental Acquis

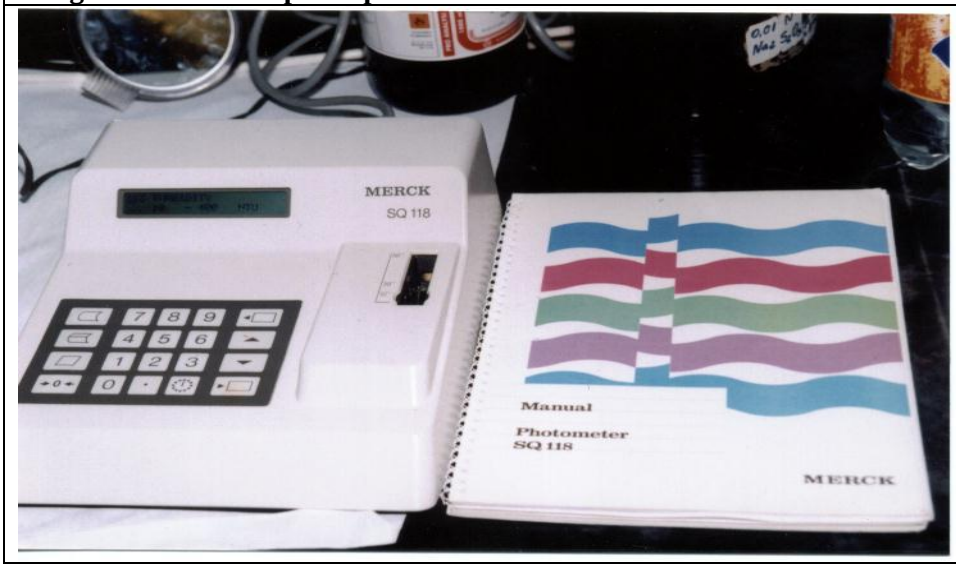
The equipment for laboratory water quality analysis is sensitively dependent on the parameters being tested, for example for most parameters such as iron, chromium, molybdenum, phosphorus, ammonium nitrate, nitrates, nitrites, is performed spectrophotometrically depending on the wavelength according to the parameter.

Imageno.4. Spectrophotometer

PNI Hydrobiological Institution- Ohrid

The spectrophotometer can also be mobile but of course it can be used on site (Image No. 5 Spectrophotometer type MERCK SQ 118 used in HMS of the Republic of Macedonia) which may be of a great importance, especially when situational on-site expertise.

Image.no.5. Mobile Spectrophotometer



NHSof Republic of Macedonia

The MERCK SQ 118 photometer serves for on-site water testing, in cases where there is a doubt that the water is contaminated and it is not safe for use. With this kind of photometer the measuring is as follows: first a sample of polluted water is taken, the next step is pH determination of the water, than if the water contains turbidity it is filtered and at the end several elements are measured such as: ammonium, nitrite, nitrate, phosphate, etc.Then, the sample of contaminated water together with a certain chemical substance is placed in the photometer. The results immediately appear in the screen, that is, the concentration of the previously selected elements is immediately shown and we can finally determine whether the water is for use or not.By doingall the operations above, the situational expertise of the water is made on the site, the polluter from the effluents is located in that area, after which water survey is carried out and the results are obtained on the site. From these results, it is up to the competent inspector to ban water for use. The equipment for testing organic matter and dissolved oxygen is plain glass equipment. In other words, glass tetrameter is used for the determination of organic matter and a Winkler glass bottle for dissolved oxygen.

Water samples are also “a subject of changing” after the sampling operation, which is directly related to their chemical, physical, and biological properties. The standard packaging techniques and the preservation of the samples are also developed in order to have no changes in the parameters such as pH, oxide-reduction status or temperature. After the sample they are observed.But in the situational expertise, the above parameters are measured on-site together with the electrical conductivity.

Samples which are used to analyze cations such as (Ca^{2+}, Cu^{2+}, K^{+}, Mg^{2+}, Na^{2+}, Ni^{2+} Pb^{2+}, Zn^{2+}) should be stored in glass or plastic polyethylene bottles with high densities and be preserved or acidified at a lower pH, using sulfur or nitric acid.

Samples which are used to analyze anions such as (NO_3^-, Cl^-, F^-, SO_4^-, PO_4^-) can be stored in polyethylene bottles with high densities and temperatures below 4 ° C. If there is no representation or preliminary knowledge about the quality of water, we stick to the following rule (natural) regarding the time of transportation of the water to the laboratory:

a) natural pure water - 72 hours;
b) polluted water, but in normal natural conditions - 48 hours;
c) very polluted water from unnatural conditions - 12 hours.

Imageno.6. Fridge with active cooling from 1°C-5°C

https://www.watersam.com/en/ws-porti_en/

Once the samples are taken, compliance with the following activities is required:
a) designated samples are transferred in separate containers according to the analyses to be carried out.
b) the sample should be stored or preserved appropriately, or pre-stored sample bottles used.
c) the cap is placed carefully on the sample bottle and the bottle is placed in a refrigerator in a temperature of 4 °C, or in a suitable plastic bag.
d) relevant data is recorded on site and a check-list is filled in.
e) a system registry for taken actions is created.
f) copies of the check lists for laboratory experts are placed in the refrigerator with the samples.
g) all equipment that is not used for sampling is decontaminated.

Imageno.7. Designatedand preserved samples in plastic bottles

Twinning project ENEA-Enforcing Environmental Acquis

4. ANALYSIS AND DISCUSSION OF THE RESULTS ACHIEVED BY THE APPLICATION OF THEFORENSIC EQUIPMENT FOR WATER QUALITY

With the above-mentioned forensic equipment for sampling, conservation, and analysis of water quality, accurate results can be obtained for the quality and at the same time the condition of the water body which is analyzed, for a specific time and for a specific place from which the samples were taken:

- *physical*(color, odor, taste, suspended solids, total dry residue),
- *chemical* (dissolved oxygen, BOD_5, nitrogen, phosphorus, sulfur and other chemical compounds, toxic substances, heavy metals, etc.),
- *biological and microbiological* (total number of bacteria, coliform bacteria, benthos, zoobenthos, etc.).

Sometimes, additional forensic equipment is used for further analysis, in order to take a sample from the bottom of the river, because the sediment shows the amount of polluting substances which are in the river, such as: heavy metals, mineral oils, pesticides, phenols, etc. The mud in the bottom of the river has the function of water purification, therefore it is important to analyze it separately, because when it is soaked with such pollutants, we can achieve reliable results[18].

It should be noted that similar analyses are done for periodic monitoring of water bodies by different institutions, such as: JSI Hydrobiological Institute Ohrid, HMS of the Republic of Macedonia, Public Health Institutions, private accredited laboratories such as Tehnolab and EuroMak Control, etc. However, these institutions make sampling and analyses of the parameters according to their possessed conditions so there is no unification of the technique of sampling and analysis of the samples in the Republic of Macedonia.This can be very important especially when the need to prove environmental crime or crime in water bodies, especially in front of the judicial authorities. In the Republic of Macedonia there is no regulation for sampling and analysis of waters and water bodies, and consequently, there is also no Standard Operating Procedures, so with

[18]Ljuština, A. (2010). *Environmental delicts and police*,Belgrade: ZadužbinaAndrejević – Belgrade (p. 61).

wrong sampling or wrong analysis we cannot obtain credible results, and the entire forensic procedure before the judicial authorities may fall because the results may not be recognized as a material evidence.This is especially important for the State Environmental Inspectorate, which is the first institution dealing with environmental crime and is responsible for the cases from the beginning until the court procedure, and if there are no regulations on water sampling and analysis, it will be difficult to prove the crime in water bodies.

5. CONCLUSION

Environmental forensics is part of the criminalistic technique, or rather its discipline which develops and applies knowledge, methods, and tools for discovering, investigating, and clarifying the environmental disorder. In order to determine the current state of all eco systems, including water and water resources, situational expertise on site is needed to prove water pollution and detect pollutants.

The authors of this text desire to point out that using the above-mentioned equipment, including the methods from the field of environmental forensics and performing situational expertise on-site, and also performing analyses of taken sample in laboratory conditions, proves pollution of the waters whether its surface water or water used for drinking and food production. This equipment and the aforementioned expertise are a good indicator as how and in what way we can apply a certain working methodology and adequate tools and technical equipment for water expert examination, for the final goal such as proving environmental crime.

But in the next phase, which is no part of the field of criminal technique but an integral part of the criminalistic methodology, or part of the criminal-operative activity, where the perpetrator of the crime or the misdemeanor should be determined. Namely, in the following period it is necessary to apply operational tactical measures and investigative actions from a wide range of police instruments, in order to determine the reason for the pollution of water and water bodies. In doing so, the principle of promptness and operability should be applied in order to act promptly and detect the perpetrators of environmental crimes or misdemeanors.

We can conclude that with the Regulations for taking and analyzing a sample from water body, criminalist technician, but in particular the state environment inspector will know exactly how to take a sample of the water body such as river, lake, or drinking water from the affected surface water, and with certainty they will know the methods, techniques, location, and depth of sampling.They will also know the purpose or the goal they want to achieve by taking a sample, knowing how to take a sample for chemical or biological analysis, knowing the nature of the polluter (whether it is dissolved or floating on the surface) and also most importantly, they know how, by forensic actions or operations to not affect further contamination during sampling.They will know how to mark, preserve, and pack the sample, and how to handle the instruments and how to calibrate the instruments in laboratory and on site, and according to the pollution of the sample, they will know exactly the time for transporting the sample to the accredited laboratories, so that the final results even though they are "silent witnesses" will very loudly talk about the status of the water body and the level of pollution, and for sure they can be used as material evidence.

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ANALYSIS OF COPPER WIRES AND THEIR ROLE IN CAUSE OF FIRE

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Abstract

The project deals with determining the cause of fire in buildings and vehicles for which there is a reasonable suspicion that they were caused by a short circuit on electrical installations. Based on experimental data, we have developed a methodology for determining whether a short circuit on electrical installations is the primary (cause of fire) or secondary (consequence) short circuit. The obtained results can be used as etalons and bases for subsequent forensic testing of materials taken from the place of the fire, in order to determine the cause of the fire, as an accidental and potential indicator of a terrorist event. The results of the research are especially important for warehouse hangars containing chemically-dangerous materials, whose release would seriously endanger human health, but also contaminate the environment. The paper deals with the prevention of electrical installations fire (timely control and replacement of electrical installations), as well as forensic analysis and laboratory testing to determine the causes of electrical fires. The work is focused on fires in facilities in ports and marinas (which would be very interesting for newly-integrated NATO countries due to the worn-out facilities), especially in warehouses and hangars where environmentally hazardous material was deposited, as well as materials that can cause ecological disaster during burning (various chemical substances, aggressive organic solvents and complex polymeric products, whose combustion releases aerosols in the form of pollutants - dioxane and furans). It is also interesting to point out fires on motor vehicles (for transporting and working) and ships and boats (where the influence of salt on corrosion is expressive, and in connection with this, the creation of a short circuit on electrical installations).

Keywords: Forensics, Cause of Fires, Short Circuit

1. INTRODUCTION

A large number of fires in buildings (business, public, and residential) are caused by short circuits to electrical installations. Namely, due to old, unsupported, damaged or unprofessionally installed electrical installations, there are failures which then cause fires. Each failure, of course, does not cause a fire, because the faults are detected on time by the protective components, which then turn off the current circuit. However, there are types of

failures to which the protective components do not respond in time, so the process continues until the conditions for the formation of a fire are created [1, 2]. The consequences of a fire, as is known, can be high material damage, injuries to people and often loss of human lives. Depending on the location of the fire, the consequences may be significant environmental pollution, for example, fires in warehouses and hangars (where chemical or hazardous substances are found or stored, aggressive and corrosive solutions, complex polymer products), oil tankers, etc.

2. ACCIDENTS CAUSED BYE ELECTRICAL INSTALLATIONS

The problem of investigating the causes of faults on electrical installations is therefore very significant, and special attention is paid to the USA, Japan, Norway and Sweden. According to the data collected by the US National Fire Brigade [3,4], in the period from 1993 to 1997, there were 4,100 fires in the United States caused by some kind of failure on electrical installations, which makes 9,7% in the total number of fires generated in the observed period in the United States. Fires caused by electrical installations thus occupied the fifth place out of a total of 12 most common types of fires (sorted by cause). Table 1 shows the location of the failure of electrical installations that caused a fire in the USA and their percentage presence.

Table 1. Displays of electrical installations causing fire in the USA and their percentage distribution [3]:

Place of failure	[%]
Conductors built into the building	34,7
Cables and plugs	17,2
Lamps	12,4
Switches, extension cords and sockets	11,4
Sources of light	8,3
Fuses	5,6
Measuring devices and their enclosures	2,2
Energy transformers	1,0
Other	7,3

Research in Western European countries has shown that electrical failures are causing 15-20% of the total number of fires. While similar research has indicated that in the period 1988 - 1998 there was an increase of 25% of the fire in eastern European countries [5].

The most common cause of fire caused by electrical installations in the Republic of Serbia is the current overload of conductors and other components of electrical installations. It occurs due to the connection of consumers to installations that are not intended for them. Namely, the temperature of electric conductors due to the flow of electricity through them must not exceed 25 ^{o}C, and therefore the dimensioning of the conductors is carried out depending on the current load, i.e. conductors must have adequate cross-sections.

The experiments showed that the electrical overload of the electrical installation component can be heated to high temperatures, but in order to produce an initial fire, the current flowing through them must be even 3-7 times higher than the nominal [6]. In

addition to overcurrent, the practice in our country has shown that there are poor quality electrical components on the market, for example, extension cables with variable cross-section conductors, so that the current strength causes heating below the expected value.

3. DETERMINATION OF FIRE CAUSES

Conducting an investigation on the place a fires, firstly by visual observation, the possible place of fire is located - the center of the fire. Inspection is conducted by persons who have received special training in the field of determining the cause of the fire. After locating the possible place of origin, the procedure is followed to determine the cause - the manner of occurrence of the fire. This part represents the most important part and it contains the recognition and explanation of the way in which the formation and delivery of heat to the fuel matter occurred, in order to start the process of uncontrolled combustion. The conclusion on the location of the fire, the manner of its formation and the method of spreading the fire must be based on scientific and logical methodology [8].

3.1. Physical-chemical methods of fire expertise

Analysis and testing of traces in the center of the fire is necessary in order to determine the cause of the fire. In order to obtain reproducible results, samples are collected from the center of the fire to the outer part in order to confirm the cause of the fire during the laboratory analysis, and then the direction of its spread. Since the quantity of pure samples on places is often very small, i.e. it is found in micro-traces, physical and chemical methods are used for analysis, where very little material is used for analysis, such as: gas chromatography (gas chromatography with mass spectrometer), method of spectroscopy (in UV, visible and IC regions, atomic absorption), X-ray analysis (X-ray fluorescence, X-ray diffraction), and some metallographic methods. Each of these methods has its own application, but also advantages and disadvantages. For example, X-ray and metallographic analysis are important for fire caused by electrical installations - whether the short circuit is primary or secondary, whereas if the flame derivatives (deliberately induced fires) are used in the fire, the analysis is very suitable for gas chromatography / gas chromatography with mass spectrometer [7, 9-13].

3.2. Determining the cause of fire caused by electrical installations

A short circuit over the electric arc (Volt) is usually the result of the current contact of the two bare conductors. At the time of their contact, a large current is created that causes melting of materials and ionizing gases in the area of contact. The established conductive bridge is nevertheless interrupted by spraying the glowing drops of metal (sparks). Experiments have shown that a short circuit over the electric arc can easily be the cause of fire if the drops of glowing metals come into contact with inflammable materials, such as, for example, paper or canvas [3]. Damage to insulation may also be the cause of a short circuit through an electrical arc. The main cause of short-circuits is the insulation of the conductors themselves caused by mechanical damage, aging material, systematic overload of conductors and moisture and other aggressive agents.

Current overloading of conductors and other components of electrical installations is the most common cause of fire in Serbia and is most often caused by the connection of consumers to installations that are not intended for them. Namely, the heating of electrical conductors due to the flow of electricity through them must not exceed 25 ^{o}C, so that the conductors must have adequate cross-sections. It is shown in Table 2.

Table 2. Cross-section of copper conductors and allowed current through them

S (mm^2)	1	1,5	2,5	4	6	10	16	25
I (A)	12	16	21	27	35	48	85	88

The heating of conductors due to the flow of electricity is a direct consequence of the law of Joule, by which the amount of heat released in the conductor (Q) is proportional to the square of the current intensity (I^2), resistance (R), and the time of flow (t):

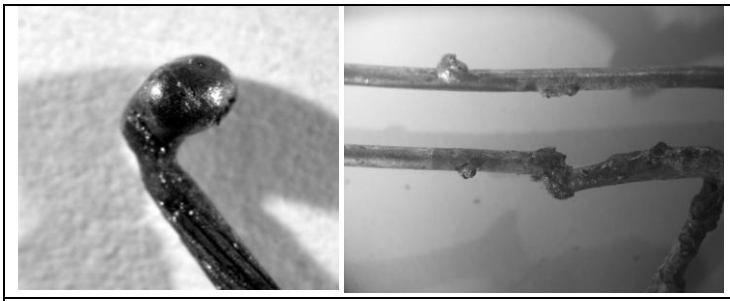
$$Q = I^2 Rt \ ,$$

and from physics it is known that electrical resistance depends directly on the specific resistance (ρ - type of material) and the length of the conductor "*l*", and vice versa from the surface of the cross-section of the conductor (*S*):

$$R = \rho \, l / S.$$

Experiments have shown that the electrical overload of the component of electrical installations can be heated to high temperatures, but in order to create an initial fire, the current flowing through them must be even 3-7 times higher than the nominal [3]. Therefore, most low voltage circuits are protected by automatic switches or fuses of 10 to 20A rated current, whose role is to switch off the power supply if the current overload occurs. However, the problem arises if the electrical component is incomplete and can not bear the declared rated current. Practice in Serbia has shown that there are poor quality electrical components on the market, for example, extension cords.

Determining the cause of fire caused by faulty electrical installations is also based on scientific and logical methodology, but also requires laboratory research. In these traces, it is especially important to determine whether a short circuit on installations is primary or secondary. If it is suspected of a primary short circuit, a test mechanical test of the conductor is carried out by bending. If the conductor is brittle and shoots when bending [7] then doubt in the primary short circuit is established and further laboratory analyzes are carried out. Laboratory methods include: x-ray structural analysis (xRd or xRF), electron microscopy (SEMEDS OR TEMEDAX), metallographic methods, etc. Whereas, if the short circuit is secondary then such a conductor contains very little copper oxide, and the conductor does not shoot even after 10-20 bending at a 90 ° angle [8]. In addition, the presence of damage along the conductor in several places also confirms the secondary short circuit. Figure 2 shows examples of the probable primary short circuit - Figure 2a and a safe secondary short circuit - 2b.



a) *б)*

Figure 2.
Short conductors:
a) a primary short circuit and
b) a secondary short circuit

4. ANALYSIS OF SHORT CIRCUITS OF COPPER CONDUCTORS

If the short-circuit is the primary one, it occurs in an oxygen-rich atmosphere, and then, in the area of warming, copper oxide (CuO) is predominantly formed. The first sample on the conductor is taken immediately behind the beaded bead (5 mm in length) while the other is taken at a distance of 30-35 mm from the beaked bead. As a result of X-ray diffraction analysis, the peaks on the X-ray are obtained which correspond to the among the flat distances Cu (for the plane (111)) and Cu2O (for the plane (111)). The angles $2\theta = 35{,}70^{o}$ and $2\theta = 44{,}30^{o}$ correspond to them on the x-ray. Based on the ratio of the intensity of these peaks (I-Cu2O / I-Cu) then it is determined whether the short circuit is primary or secondary. Namely, if this relationship in sample 1 in comparison to sample 2 is greater than two or more times - it is a primary short-circuit. But if this relationship in sample 1 is two or more times smaller than in sample 2 - it is concluded that it is a secondary short circuit. Rendgenograms of short-circuit samples of copper conductors are shown in Figures 5 and 6. Figure 5 represents a sample of a conductor in which a short circuit in the air is caused and it represents a primary short-circuit. Only a copper (Cu) peak is registered with this sample, while the total absence of copper oxide peaks (Cu2O) occurs. Figure 6 shows the rendgenogram of a conductor causing a short circuit in the atmosphere of poor oxygen (fire and smoke). As can be seen from the picture, two peaks are registered at 2 = 36.720 and 2 = 43.700. The analysis found that these are copper and copper oxide peaks. In this case, it is noted that the copper peak intensity is greater than the copper oxide intensity (I-Cu> I-Cu2O). This result could be a consequence of an atmosphere of smoke in which there was not enough oxygen to form a larger amount of Cu2O and Cu prevails.

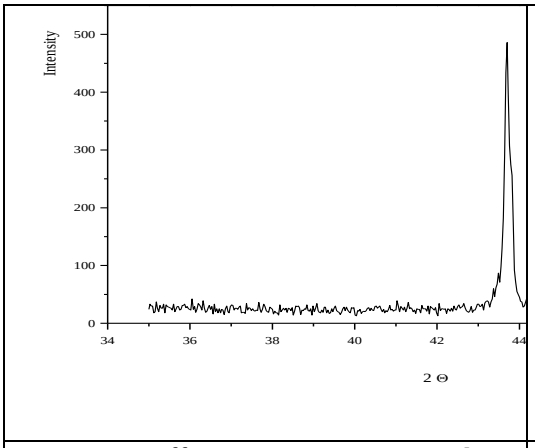


Figure 5. Diffractogram in primary short circuit

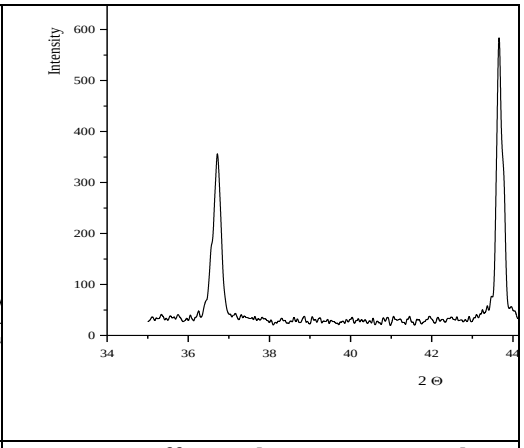


Figure 6. Different diagram in secondary short circuit

5. CONCLUSION

Based on the above, it is concluded that it can not be reliable solely based on diffractograms whether the short circuits is primary or secondary, so it is also necessary to carry out metallographic testing of the samples. This attitude is also applied in the current practice, because for the assertion that some short-circuited compound is the primary cause of fire, it is necessary to confirm at least two laboratory methods. The results of the conducted forensic analysis would be used directly in operational analysis of concrete and real events as terroristic events (especially for prevention) with direct application in the problems of the defense and security system, in order to prevent air pollution and its spread by air currents.

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CRIMINALISTIC PROFILING - POSSIBILITY OR NECESSITY?

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Abstract

Numerous crimes that occur in the world on daily level require approach which will make a picture of the perpetrator and the characteristics of their personality in the most appropriate way, and will lead to their faster capturing. With the advent of serious cases and inability to resolve them, criminal profiling was developed and included experts from various fields and professions, from the ranks of the police or outside of it as expert consultants. The main characteristic of the profiling is that a consequence of a criminal act is the basis for the development of the profile, and the profilist uses their own methods to create a profile of the executor, which should include characteristics and specifics of the potential executor. The victim and the commission of a crime are in the main focus of the profilist, and the aim is to create a profile of the perpetrator based on a number of conclusions. Criminalistic profiling expansion happened during the 50s of the last century, but its most widespread use is on the territory of the United States, where they established special units to illuminate the serious and specific cases of the offenses. Numerous experts have contributed to the development of profiling and its definition, and their help and expertise are used with a greater or less extent depending on the type and seriousness of the crimes. Using crime profiling in Bosnia and Herzegovina has not yet been rated as a necessity, but that does not mean that its introduction and development would not reduce and resolve the number of certain crimes, and at the same time prevent acts which could happen and those whose scope and consequences we are not aware of.

Keywords: *criminology, profiling, victim, consequences.*

"In some ways, profiling is really still as much an art as a science"

Harvey Schlossberg

1. INTRODUCTION

New approaches in criminalistics require time for their development and establishment. There are numerous definitions and understandings of the concept of criminalistic profiling. Further development of these phenomena cannot be predicted but it is certain that the public, institutions, and individuals are more interested in new ideas which will prevent various criminal acts and assist in resolving of the existing ones.

As a science, it is still a relatively new field with few set boundaries or definitions. Its practitioners do not always agree on methodology or even terminology. Despite the different names, all of these tactics share a common goal: to help investigators examine evidence from crime scenes and victim and witness reports to develop an offender description. The description can include psychological variables such as personality traits,

psychopathologies and behavior patterns, as well as demographic variables such as age, race or geographic location. In 1974 the FBI formed its Behavioral Science Unit to investigate serial rape and homicide cases. From 1976 to 1979, several FBI agents interviewed 36 serial murderers to develop theories and categories of different types of offenders (Winerman, 2004).

2. DEVELOPMENT OF PHENOMENA

There are different opinions and definitions about profiling and its development. Edwards and Sheptycki (2009) say that in modern criminology, offender profiling is generally considered the "third wave" of investigative science. The first wave was the study of clues, pioneered by Scotland Yard in the 19th century, the second wave was the study of crime itself and this third wave is the study of the psyche of the criminal. By certain authors (Evans, S. Skinner, K, 2013)profiling techniques existed as early as the Middle Ages, with the inquisitors trying to "profile" heretics. The first offender profile was assembled by detectives of the Metropolitan Police on the personality of Jack the Ripper, a serial killer who had murdered a series of prostitutes in the 1880s. The police surgeon Thomas Bond was asked to give his opinion on the extent of the murderer's surgical skill and knowledge. His assessment was based on his own examination of the most extensively mutilated victim and the post mortem notes from the four previous canonical murders. In his notes dated from 1888, Bond mentioned the sexual nature of the murders coupled with elements of apparent misogyny and rage. Bond also tried to reconstruct the murder and interpret the behavior pattern of the offender and came up with a "profile"- signature personality traits of the offender - to assist police in their investigation. In 1912, a psychologist in New York, delivered a lecture in which he analyzed an unknown criminal who was suspected of having murdered a local boy named Joey Joseph. Based on the postcards which had been used to taunt the Lackawanna Police and the Joseph family, the profile ultimately led to the arrest and conviction of J. Frank Hickey. In the first half of the 20th century, James Brussel was called upon to analyze the information on the Mad Bomber in New York City, and he created an accurate profile of the offender. The FBI then worked to develop a technique for profiling, based on the process used by Brussel. As time, the nature of crime, and knowledge of human motives and behaviors evolved, and with the growing addition of forensic science, profiling is also changing (McLaughlin, 2006).

Roufa Thimothy (2017) quotes that the title "criminal profiler" is used to describe investigators who specialize in inductive and deductive reasoning to build a profile of particular criminal based on characteristics of the crime committed. Most profilers are law enforcement investigators with several years of experience investigating violent crimes and who have training and degrees in forensic science and psychology. According to the FBI- the agency that pioneered criminal profiling in addition to their law enforcement and police academy training, criminal profilers receive professional training and development to hone their skills and prepare them for the specific job of profiling.

Case linkage, the identification of crimes suspected of being committed by the same perpetrator on the basis of behavioral similarity, and offender profiling, the inference of offender characteristics from offense behaviors, are used to advise police investigations (Woodhams, Toye, 2007). Since its emergence, offender profiling has been described by

several different terms: psychological profiling, criminal profiling, criminal personality profiling, and criminal investigative analysis. Regardless of the descriptive label applied, profiling as an investigative tool today represents a less than educated attempt to provide law enforcement agencies with detailed information about the behavior of an unknown individual who has committed a crime (Godwin, 2001). Deductive profiling is different from other forms of profiling; it focuses on criminal profiling as an investigative process, solving real crime through an honest understanding of the nature and behavior of criminals. It approaches each criminal incident as its own universe of behaviors and relationships (Turvey, 2002).

Some researchers indicate that profilers are most efficient in cases where the unknown perpetrator has displayed indications of psychopathology (Holmes, Holmes, 2000). Profiling is therefore an attempt to generate a consistent personality pattern, and is based on the principle that character traits can be inferred from crime scene behaviour and then used to predict other behaviour (Homant & Kennedy, 1998).

3. PROFILING PROCESS

The profiling process, whether made by a reputable, internationally recognized organization, or some local police administration, needs to be considered critically and its reliability, validity, and usefulness always examined. Objective evaluation is, therefore, an inevitable part of the criminal profiling process. Each profiler needs to be aware of his limits when creating and reporting on a profile of a killer (Repišti, 2016).

Over the past quarter-century, the Behavioral Science Unit has further developed the FBI's profiling process-including refining the organized / disorganized dichotomy into a continuum and developing other classification schemes where the basic premise is that behavior reflects personality. Criminal profiling is currently used in three phases of the criminal justice process: criminal investigation, apprehension, and prosecution. Within the criminal investigation phase, profiling still seems to be used after traditional investigative methods have been unsuccessful. In this phase, the goals of profiling are to link offenses together as part of a series, to identify physical, psychological, and lifestyle characteristics of unknown offenders; to suggest the pre- and postoffense behaviors that an offender is likely to exhibit; to evaluate the potential for certain criminal behaviors to escalate to more serious, violent crimes; and to suggest proactive tactics to flush out or lure an unknown offender into revealing his identity. Within the apprehension phase, the goals of profiling are to suggest items to include on search warrants as well as locations to be searched, to predict an offender's reactions or behaviors on arrest, and to suggest interrogation techniques that are likely to elicit a confession. Finally, in the prosecution phase, the goals of profiling are to provide expertise in the courtroom to demonstrate the linking of multiple offenses to one individual and to match a particular individual to the relevant crime(s) by virtue of his or her fit with the profile (Hicks, Sales, 2006).

Holmes and Holmes (2008) stated that there was a tremendous amount of interest in the field of profiling, but that is the only tool and it has never solved a murder case alone. Criminal profiling refers to the process of identifying personality traits, behavioral tendencies, geographic locations and demographic or biological descriptors of an offender based on characteristics of the crime. Although the concept of criminal profiling has been popularized as a somewhat revolutionary concept, the underlying

premise is, in truth, remarkably old and indicative of a fascination humans have always held in trying to understand and predict criminality (Koscis, 2006).

There are no absolutes in human behavior and it is rare that a criminal profiler will perfectly match an offender. There may even be instances in which the profile is largely inaccurate and even this is to be expected because, after all, it is a subjective opinion (Hazelwood, Burgess, 2008).

Criminal profiling structures its analysis through answers to three primary questions:

1. What happened at the crime scene?

2. Why did these events happen?

3. What type of person would have done this? (Rossmo, 1999).

The development of profiling and other forensic behavioural science techniques is in its early days. While this may sometimes result in frustration, it is also an exciting time with much potential for future evolvement. Profiling is a useful and promising investigative methodology. It is also a novel technique, the maturation of which requires a commitment to not only data collection, analysis, and research, but also to operational feedback and integration (ibidem).

4. CRIMINALISTIC PROFILING - APPROACHES, MODELS, AND ETHICS

Currently, the most developed stage of criminal profiling is in the United States, where the awareness of criminal profiling as a profession is raised also through the TV show "The Profiler" and through popular characters such as Hannibal Lector of *the Silence of the Lambs.* American Criminal profilers take into consideration important details, such as:

- The manner in which crimes were committed
- The location of crimes
- The choice of victims
- The type of crimes
- The timing of crimes
- Any communication from the suspect
- The condition of the crime scenes

In addition to those listed, profilers look at a host of other factors to determine suspect characteristics such as age, race, residence, and mental state. The job of a criminal profiler often includes:

- Visiting and analyzing crime scenes
- Reading reports from investigators and other analysts
- Writing reports
- Providing court testimony
- Working with police officers and detectives
- Studying human behaviors and characteristics (Roufa, 2017)

Ainsworth (2001) defined offender profiling as a set of techniques used to solve crimes by identifying patterns of criminal activity and behavior and identified four main approaches to offender profiling:

1. The geographical approach - patterns in the location and timing of offences to make judgments about links between crimes and suggestions about where offenders live and work.
2. Investigative psychology - uses established psychological theories and methods of analysis to predict offender characteristics from offending behaviour.
3. The typological approach - involves looking at the characteristics of crime scenes to assign offenders to different categories, each category of offender having different typical characteristics.
4. The clinical approach - uses insights from psychiatry and clinical psychology to aid investigation where an offender is thought to be suffering from a mental illness or other psychological abnormality.

In the process of criminalistic profiling, it is important to follow and bear in mind certain ethical standars. This is not a characteristic only of profiling, but also of every process, especially when we talk about sensitive areas. In the professional literature and when the subject is criminalistic profiling, certain ethical guidelines are stated, such as:

- Integrity - the profiler should make no statements that are false, misleading, or deceptive;
- Preventing the misuse of profiling - the scientific and professional judgments and actions of the profiler have great potential to affect the lives of others;
- Competence - the profiler should strive to maintain high standards of competence.
- Professionalism - the profiler has a social obligation to contribute to human welfare by the application of specialized knowledge in a professional, competent, and ethical manner;
- Consent - when conducting an interview, there is a need to make clear for which side the profiler is working, and the limits on confidentiality of any such interview;
- Confidentiality - the profiler should not release confidential information pertaining to an
  ongoing criminal investigation;
- Profiling and Ssciety - scientific tools and methods should only be employed for the social good of society;
- Preventing and responding to Misconduct - in questionable situations, the profiler should seek the counsel of colleagues in order to prevent or avoid unethical behavior (Burnett, 2001).

Turco (1990) advocated the use of a psychoanalytical approach to profiling. His model was called *the Turco's model* and his perspective is a psychoanalytical orientation. He emphasized the need to integrate neurological understanding when preparing the profile of a suspect. This model consists of four dimensions. First, the profiler is to "consider the crime scene in its entirety". Second, the importance of integrating knowledge about neurological behavior when developing a profile is highlighted. Third, preparing a profile is described as requiring a psychodynamic perspective. The fourth factor involves the study of the demographic characteristics of the crime.

The psychological profile of perpetrators of crimes, especially those most serious with elements of violence, has always been the subject of research by scientists and additionally gained significance in cases when it was necessary to assess their mental state, i.e. whether they were countable at the time of the commission of the crime. However, while psychiatrists, psychologists, and experts from other related scientific disciplines had earlier performed an analysis of the perpetrator and his psychological profile only when it was available, i.e. after deprivation of liberty, nowadays the assistance of these experts is also used during the investigations itself, mainly in the case of serious murders and rape cases. The application of profiling and the participation of experienced experts have become a standard procedure in investigation of complex criminal offenses with elements of violence. In order to obtain the criminal profile of the perpetrator, a comprehensive analysis of all the evidence found on the spot, as well as the data collected about, is required. At the core of all profiling techniques there are two basic logical methods-induction and deduction. Therefore, their application requires a good knowledge of the rules of logic and reasoning, in order to establish the facts in interconnection, separating the important (key), unimportant (coincidences) and linking in such a way that their functional meaning becomes criminally meaningful (Marinković, Stevanović, 2014).

5. PERSPECTIVES OF CRIMINALISTIC PROFILING WITH REVIEW ON BOSNIA AND HERZEGOVINA

Holmes and Holmes (1996) emphasized the importance of collecting information on victims, and they criticized the paucity of victim information contained in most police reports provided to profilers. They advocated collecting information about physical traits, marital status, personal lifestyle, occupation, education, personal demographics, medical history, psychosexual history, criminal justice system history, and last activities.

An important segment for each profession is education, i.e., defining an adequate educational profile as a necessary condition for gaining knowledge that is applied in the profession. Currently, it is not defined what constitutes formal education of a profiler (university or otherwise), which results in the situation that everyone is called a profiler. Today, most profilers are forensic (criminal), psychologists, psychiatrists and lawyers (Đurđević, Kolarević, Ivanović, Milojković, 2012).

When it comes to the possibilities to use criminal profiling in Serbia, according to Kolarevic and associates (2010), the data so far indicates that there are no serial killers in this country, which does not mean that they will not be there. In this sense there is no immediate need for eventual engagement of the profile. But, there are serial rapists, multiple returnees, and administratively existing opportunities that profiler participates in police work. An expert with good knowledge of clinical psychology and geo-information technology, knowledge of criminal offenses can contribute to the work of the criminal police in the field of sexual offenses with unknown perpetrators. More possibilities of contributing to the profile are the crimes of serious theft, gangs, extortion, blackmail, kidnapping, as well as cooperation with the negotiating teams of the Ministry of interior of the Republic of Serbia (ibidem).

Profiling is most frequently used in solving serial violence crime. It is credit about elucidation of most serioius crimes by an unkown executor. This domain in criminalistic practice in Bosnia and Herzegovina is not represented in full capacity. From one point of view, the couse is cognition non-entity about profiling meaning in case of

unkown prosecutor which would demand meticulously profiling in purpose of its illumination (Bojanić, Srdanović, 2012).

While in the world geographic profiling is a daily activity of police officers, in Bosnia and Herzegovina this technique is completely unknown. No law enforcement agency in Bosnia and Herzegovina in its operational work applies this technique. Also, there is not a single training program for police officers in the field of geographical profiling, while in the world, police officers, in addition to their special profiling teams, use consulting services of prominent experts in this field when needed. Geographical profiling is not even studied within the teaching process of higher education institutions. In the police practice of Bosnia and Herzegovina there is a small number of detected cases of serial killers or mass crimes, and there is an impression in public that such crimes are rare in the Bosnia and Herzegovinian society. The practice of geographical profiling and criminal profiling would greatly contribute to a better understanding of criminal behavior in Bosnia and Herzegovina and more effective fight against crime, but also for better planning and coordination of activities of police officers in the direction of crime prevention (Cacan, 2010).

6. CONSLUSION

Modern society brings more complicated criminal offenses and social anomalies. Also, with the development of modern technologies, it is harder to discover perpetrators who nowadays have more tools to stay undetected. This implies that professionals who work in the area of criminalistics must be educated properly and more specialized. Bearing in mind that every country has a different structure, level of crime, type of criminal offenses and different financial and expert capacities, it is important that criminalistic profiling exists because it represents response to negative phenomena faced by every society. Criminalistic profiling can influence on prediction, reaction and prognostic of different criminal acts, and most important - it can preserve human lives and affect on their security.

Regarding the available data and papers written about criminalistic profiling in Bosnia and Herzegovina, it is obvious that currently there is a lack of interest for this area. Reasons for this can be different - no need for profiling, no motivation or overload of decision makers from the area of criminalistics with other urgent and complex processes. It can be said that criminalistic profiling is both possibility and necessity.

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EVIDENCE AND COGNITIVE COURSE IN THE CRIMINAL PROCEDURE

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Abstract

The problematics of the evidence and the process of the argumentation of criminal records is primarily an object of study of the theory of court evidence as part of the criminal process science, while at the same time it is an object investigated by the criminology science. The theory of court evidence deals with the legal side of argumentation as a dynamic system of legally regulated activities for determining relevant facts according to the norms of criminal procedural laws. Criminalistic theory of evidence is primarily concerned with the regularities and the occurrence of evidence in general, their informative nature and the gnosiological (cognitive) essence, the regularities of the formation of certain types of operative and evidential information (the existence of real and personal evidences, the characteristics and specifications of certain types of these pieces of evidence and their informative value), as well as the durability of the crime information. On the basis of cognitive laws related to the mechanism of occurrence, durability and quality of certain pieces of evidence, the criminology explores and develops methods for their detection, fixation, collection, research and evaluation of their evidential values. During the criminal proceedings (especially in the pre-criminal and investigative proceedings), numerous and diverse procedural actions are undertaken in the course of the discovery, investigation, clarification and proving of the objective truth about the criminal acts and the subjective guilt (responsibility) for their perpetrators, among which there is a mutual connection, continuity and in each criminal case, they constitute a complete whole. In that sense, in the paper, certain aspects of the evidence and proving through the cognitive course within the criminal procedure as a syllogistic criminal procedure are presented and processed.

Keywords: *facts, evidence, proving, criminal procedure*

1. INTRODUCTION

Criminality, manifested through many different organized and transnational forms regrettably in these contemporary living conditions as well, implies a more serious negative phenomena, unpleasant trends and social ill with which a lot of crucial human rights, freedom and social values are threatened. The protection of public goods, state interests, person's property and integrity are within the boundaries of the state's law to prescribe criminal acts and sanctions for the persons who threaten, harm, and destroy them. In the total sum of the complex process of preventive and repressive measures and acts which the competent authorities and institutions are taking as well as the subjective forces in the fight against criminality and its perpetrators, the crime detection plays a crucial role. *The detection, research, and argumentation* of criminal acts and their perpetrators, as a specific form of searching for the truth in this area, should be in alignment with the social

progress, as with it a part of the obstacles that appear in the social development and progress are eliminated and on the same side, the human and society's freedom are enriched[19]. In essence, *the detection of criminal acts and their perpetrators* in an operational sense represents the process of human realization which includes establishment of facts, evidence, conditions and circumstances that point out to and confirm that crime was committed, i.e., through facts and evidence that have been determined in the criminal procedure and the penal procedure their perpetrators are detected and taken to the judicial authorities. The Criminal procedure[20], although complex in its process actions, is aimed towards its *main goal:* through legally established rules, a proper conduct of the procedure should be enabled, and in that way, *no one innocent should be convicted*, and for the perpetrator of the criminal act, a proper criminal sentence should be passed down according to the conditions provided by the criminal law and on the base of a proper law procedure (act 1 from CPA). With that, it should be pointed out and constantly kept in mind, from the competent and interested parties in the criminal procedure, the legal principle of *presumption of innocence* which reads as follows: "the person charged with a criminal offence will be considered innocent until their guilt is determined by a final judgement" (act 2, p.1 – CPA). This means that, until then, on the basis of the evidence weighted on the convict, no matter how strong, obvious, convincing, it might be taken as probably criminally responsible. In addition, the state institutions, media, and other parties are obliged to abide by the rule of the presumption of innocence, and on their public statements for the ongoing procedure, they shall not hurt the rights of the offender and the damaged, as well as the judicial independence and impartiality (act 3 p. 2 – CPA). *The main goal* of the criminal procedure is to reveal if the crime was really conducted and if this is determined right, to determine its perpetrator to whom the criminal sanction should be imposed in alignment with the provisions of the substantive criminal law.

2. PENALTY PROCESS AND CRIMINAL ASPECTS OF THE EVIDENCE AND ARGUMENTATION

Criminal procedure (Latin: processus criminalis, English: criminal procedure, French: procedure penale, German: strafprozess, Italian: procedura penale) represents a sum of process actions taken by the process parties when there is a ***reasonable doubt*** that a certain person committed certain crime. The doubt that the crime was committed is the base on which numerous criminal activities are taken in conditions when there is the slightest probability that the crime was committed is called *reasonable doubt* (indication) which precedes the initiation of the criminal procedure. During the criminal procedure, numerous and varied process activities are taken. Here we can mention the mutual connection, continuity, and per each criminal case they make one rounded whole.

In the criminal procedure, as in any other lawsuit, there is a tendency to determine the fact situation through a multidisciplinary approach and application of contemporary criminal-forensic methods and techniques.

[19]Spaseski.J, "The accomplishment of the social self-protection as an effective instrument in the discovery of the criminal acts and their perpetrators and the problem of the evidence and the argumentation"Pravna misla – a magazine on law and social issues, Skopje, July - August 1983, No. 4, p. 269 - 270

[20]Criminal Procedure Act (CPA) Official Gazette of the Republic of Macedonia, No.150 from 18.11.2010

According to the criminal proceedings and criminal theory and practice for this procedure, there are these specific facts that must be determined and that would give answers to the following questions: 1. Was crime committed in the particular case? 2. Is the person against whom the request for the criminal procedure is raised, the perpetrator of the crime? 3. Is the person guilty or not for the crime for which he or she is charged? 4. Can the criminal sanction be applied in the terms of the substantive law?

Crime represents a complex real phenomenon which was committed in the past (with relatively longer or shorter time period), and whose discovery, research, clarification and argumentation is complex, creative, painful and cognitive process aimed towards reconstruction.

The process of cognitive and other reconstruction on the flow of the crime is done through discovery, fixing, clarification and use of criminal (operational and argumentative) information, facts, evidence and other circumstances in the course of the criminal-operative and investigative activity which are inextricably linked that mutually upgrade and complete one another. [21]

2.1. In general, on the terms fact and crime information

On the term *fact* (Latin: res fakti) in the philosophical, methodological, and criminal process literature, there are many different and sometimes conflicting interpretations. In a broader sense, the term fact is by experience determined as the objective existing relationship between the objects, phenomena, processes, conditions, and circumstances.

About the facts and its familiarity, Bogdan Sheshik [22] writes concisely: "we cannot conclude any, even the simplest factual condition without or below the basic factors of the cognitive process and those are the practice as a sensory activity and the theory as a cognitive side of the overall activity. The fact is a cognitive-sensory activity, certain objective-real existence of a certain act, phenomenon, process, event, characteristic and relation". According to this, the fact is that piece, part, fragment from reality that man has excluded from the system of the overall connection between circumstances, events, reflected in man's consciousness.

In the criminal field, apart from concluding of the existing (positive) facts, the need for awareness in the terms of negative facts is also indicated. According to Vodinelik,[23] the term "negative fact" (which means indication), represents not only the absence of something, but also the existing traces of certain objects of the criminal act, if the former or the latter contradict to the common flow of the act. It represents a *signal* that gives an information, encoded information, change caused by the criminal act that could significantly contribute as a key for disclosure of planned criminal acts. The very *factual situation* is a combination or a sum of certain facts that have to be concluded in the criminal proceedings, and for the making of the effective decision, i.e. as a sum of facts on which it is directly based on the application of material or formal criminal law of a certain criminal case (materially legal and procedural law relevant facts).[24]

[21] Angeleski,M., Criminalistics theories, Skopje,2014, p. 51 - 55

[22] Sheshik, B. Logics, Belgrade, 1962, p. 620; General Methodology, scientific book, Belgrade,1974, p. 273

[23] Vodinelik.V: Criminal tactics part I, COKOB, Skopje, 1995 p. 512

[24] Krapac,D.: Criminal Law, Part I: Institutions, Narodne novine, Zagreb, 2003, p. 304

In a criminal sense, the term factual situation represents a combination of facts and the relation between different facts (cases, events, phenomena, parts of some cases, conditions, etc.) in a specific criminal situation.

On occasion and upon detection of each criminal act there are numerous and various *change*s in the outer world that in essence might have *material* and *ideal* (psychic) nature. These changes contain numerous and various *information* of the criminal (punishable) act, the perpetrator, victim, the way it is committed, the asset with which it is committed, the motives and other important facts and circumstances. Thus, for example, the changes from material side represent the traces of the criminal act and the perpetrator, which were made while committing the crime, the same goes to their planning and preparing (preparatory actions) or concealment. The same way, while committing the crime there are certain changes from the *ideal side* (witnesses and their recollection, recollection and survival of a victim of a crime, as well as other changes that occurred in the mind of the perpetrator of the crime and which manifest as psychological consequences, etc.).

With that, the *crime information* carriers are called *signals* which may have a material or ideal (psychic) nature. As material carriers of the crime information there are objects and traces (macro and micro) of the crime, and the criminalist is working on their research, detection, fixation and interpretation (decoding, analysis, expertise) by using the modern knowledge above all the criminalistics technique (i.e., traceology). As ideal (psychic) carrier of the crime information is the recollection (the engram) of people who were directly involved in the crime, and the perpetrator. The criminalistics tactics, technics, and methodology are dealing with their detecting, fixating, and interpreting, as well as the judicial psychology and judicial psychiatry.

Related to this, during the criminal action it is necessary to always take into consideration the fact that the criminal act as a real life phenomenon (that happened in the past in shorter or longer period of time since the detection and revealing from the place of crime for carrying out inspection and investigation), it is not in a static condition, but on the contrary, it is a continuous dynamic phase of a fast and constant deviation and disorganization. From the moment when the material and ideal signals of the crime were created, they begin to change, transform and disappear, no matter if it is about real or personal carriers of the information. The material carriers of information can be damaged or destroyed as the time passes; that might be from atmospheric abnormalities, people that offered help to those who have suffered, and most commonly from the perpetrator who tried to eliminate the real traces, to fake other traces with the purpose of shifting the investigation to an opposite direction, etc. Psychic carriers of information, i.e., the memories also fade away and change their direction as the time passes. Because of this, it is necessary for the criminal activity to be taken and directed in alignment with the criminalistics principles of legality, speed, operations and thoroughness of the actions with which it would enable the crime information to be detected and fixed in due time as this would be the only way that would prevent their damaging, destroying and losing.

There are many differentiations of crime information. From the aspect of evidence value of the crime information, they are divided into operational and evidence-based.[25] The *operational information* is detected and discovered in the pre-criminal (previous) investigation with taking of appropriate operational-tactic measures and activities. They are detected by the authorized people from the judicial police, most

[25] Simonovik, B., Criminalistics, third amended and added edition, Faculty of Law - Kragujevac, 2012, p. 78

commonly the police officials from the Ministry of Internal Affairs. It is emphasized that the operational information has no character of evidence in the true sense of the word and as such it can never appear in the criminal procedure nor represent a base for reaching a verdict, nonetheless, its character is of a logical evidence. It is an evidence of the heuristic (cognitive) sense of the word because it directs the crime-detective activity in pre-criminal investigation in a direction it should investigate for other operational information and evidence. The operational information represents orientation-elimination inductions and at the same time it can have a preventive and repressive character.[26] The *evidence-based information* is such information which is gathered and fixed in a way and form which is prescribed by the Criminal Procedure Act (CPA) from the subjects that according to this Law are authorized to take evidence and actions. The form of the criminal process and criminal proceeding of the institutions of the criminal procedure are determined with the CPA, while its material content is given by the forensic sciences such as criminology, forensic medicine, judicial psychology, judicial psychiatry, judicial chemistry, etc.[27] Within the pre-criminal procedure, through the application of legitimate various criminal-operational and tactic measures and activities, only the detection of crime information may be accomplished. However, in order to save them permanently, it is necessary to protect the collected operational information with the application of evidence-based information. The acquisition of evidence-based information is done through the presentation of its content and form in a manner prescribed in the CPA (e.g., examining of a witness, expert) and *fixation* of revealed information (in a manner prescribed in the CPA) which will prevent it from destroying, changing and forgetting. The more recent criminalistics literature includes two differentiations of the crime information which are of importance to the criminally informative and criminally analytical activities. The former relates to: *a) crime information occurred before the crime; b) crime information occurred on the place of crime;* and *c) crime information on the occasion of the crime*. The latter relates to: *a) information that refers to the past (history of the criminal act, etc.), b) information that refers to the present condition of the criminal act,* and *c) information that refers to the future trends of criminal acts*.[28]

2.2. Evidence and argumentation of the criminal procedure

The term *evidence*, (Latin: probatio, argumentatio, English: evidence, German: beweis, French: evidence), represents each element which speaks in the favor of the truth of an important fact in the procedure. In the Macedonian language[29] the term *evidence* means available facts, documents, etc., which show whether something is true or false, or support or deny opinion, belief, assumption (evidence material, it proves that it is right), etc. In its essence, the evidence represents established, ascertained relevant relation between the processes which directly or indirectly influenced the inception of the criminal act, the traces, subjects and people. Examined from a gnoseological perspective, the evidence represents *all changes* in the middle of the preparation, execution, concealment and taking advantage of the fruits of the crime which are in a *relevant link* with the criminal act. Thus, for example, each fingerprint on the knife is not an evidence. To

[26]Boshkovik, M., Material evidence in the criminal work, Belgrade,1990, p. 31
[27]Vodinelik, V., Scientific problems in the relation evidence source-evidence-argumentation in the criminal law procedure, *Anali N*o. 3 - 4/1994, p. 293
[28]Manojlovik, Dragan, *Criminalistics analytics* Belgrade, 2008, p. 121
[29]Murgoski, Z.: Macedonian Language Dictionary, Faculty of Philology, Skopje, 2005, p. 158

become an evidence, it must be related to the commitment of the murder and the use of certain cold weapon. Evidence is the fact that is connected to the crime from *within.* In that sense, the evidence cannot be created by the criminal procedure in its process work, but it is ignited by committing of the crime in the process of mutual connection between the perpetrator, means of execution, the object attacked, the place. The institution of the criminal procedure only asserts, in a procedure prescribed by law, the existence of these connections based on the changes which reflected on the carriers of the crime information (signals). From that aspect, the evidence may be defined as material and psychic change caused by the execution of the crime which bears within information of the crime, perpetrator and other criminal law relevant facts, fixed in a form and in a manner prescribed in the Criminal Procedure Act and authorized subject by the same law.[30]the s*ource of evidence* is a carrier of evidence-based information and it may be of material nature (trace, subject of crime) or psychic nature (witness who is in condition to announce their notes about the crime). The *means of evidence* (as it is noted by the processionists), is a process activity, taken in alignment with the CPA, and by the Law authorized subject with the aim to determine the evidence-based information and their fixation. Evidence acts are the examining of a witness, expertise, insight, hearing of the offender, etc.

The *argumentation* is a process of giving evidence, i.e., presentation of its content in a form and manner prescribed in the CPA (e.g., examining of a witness, expertise, and with taken content by fixating, as to avoid changing, destroying, and forgetting.

The court is obliged on the basis of *free assessment on each piece of evidence separately and on the other pieces of evidence*, to draw a judgement on the reliability of the existence of certain facts. The court bases its judgement only on the basis of the evidence which is presented on the main hearing. *Judgement* or a resolution that corresponds to a judgement, *it can be drawn by the court on the basis of the facts in whose certainty it is convinced.* In the *argumentation case* enter those criminal justice facts which are subject to the process of argumentation and represent an argumentative basis for making right and fair court judgement (e.g., verdict, resolution).

Determined, legally relevant facts which compose the argumentation case, are established (proved) with the help of the evidence-based facts (evidence). For example, the guilt of the perpetrator (direct intent) in a certain case of murder (or attempt for murder) is determined with the help of a witness who heard or saw the threats addressed to the victim (e.g., "*I will kill you"* or other threatening non-verbal gesticulations). Besides the *decisive facts* (those that have to be proved), *evidence-based facts or* evidence (facts with the help of which it is determined the existence of decisive facts), there are *supporting facts*. The supporting facts are representative materials from neutral, unsuspicious origin (which are not established in the process of the commitment of the crime and are taken from known person or object that served as identification), which in the process of identification are used with the comparison method due to the determination of the identity, i.e., the group belonging of the wanted (identification) object.[31] For example, in the apartment where there has been a burglary there was discovered a fingerprint of unknown person. The founded fingerprint is compared with the fingerprints from the suspects and with the

[30] Compare with the definition of evidence given by Vodinelik,V.: What is the proof in the criminal procedure and criminalistics? *Criminalistics detection and argumentation*, Skopje, 1985, 2 Volume, p. 1111 Scientific problems in the relation evidence source-evidence-argumentation in the criminal law procedure, *Anali*, No. 3 - 4/1994, p. 292

[31] Vodinelik, V., *Criminalistics, detection and argumentation*, Volume 2, p. 937

fingerprints from the registered burglars in the criminalist dactyloscopic collection, to be able to find the perpetrator. These fingerprints represent neutral comparative samples. The *commonly known facts (notorious)* are those for which existence, no dilemmas and trials exist. In this type of facts enter those facts for which the parties agreed together with those that does not contradict with the other evidence. Due to the different nature (material and personal) of individual sources of evidence of the evidence-based information and depending on them, the criminal activity is importantly conditioned in the process of their detection, fixation, and valuation. [32] In that sense, the classification and differentiation of the sources of evidence and evidence-based information of *real (material*) and *personal*, in our opinion, is a rational and has a special importance in the criminal activity. Also, in the literature of the penal procedure law and criminology, there is a differentiation between: *original* and *invented* evidence (depending on the carrier of the evidence-based information), *indirect* and *direct (indicated)* evidence (depending on the meaning of the relations that exist between the evidence and the key facts).[33]

3. PLANNING OF THE CRIMINAL PROCEDURE AND COGNITIVE COURSE OF THE CRIMINAL PROCEDURE

The Republic of Macedonia's criminal procedure[34], consists of four phases which complement each other and complete one systematic whole, and that is: 1) previous procedure (i.e., pre-investigative and investigative procedure); 2) accusation (indictment and assessment of the indictment); 3) main hearing and verdict, and 4) legal solution procedure. The doubt that the crime has been committed is the base on which numerous criminal activities are taken in conditions where there is only a slight reason for suspicion (indication) and precedes the start of the criminal procedure.

From the moment of detection of the existence of a possible criminal act or of possible potential perpetrator (or, for both one or the other criminal tactical situation), through the final clarification of the criminal act that indicates the existence of a certain criminal act and its specific way of occurrence to the detection of the committed criminal act and its perpetrator, the quest for the truth as in the phases of the detection, the same goes for the prosecution and judgement, it has to be conceptualized and led in a way which will lead to the accomplishment of the goal of the pre-investigative and criminal procedure. That would be achieved if from the very beginning, the criminal procedure is based on the methodical and systematic planning and acting in alignment with the procedural principles and the criminal procedure. The detection, argumentation, clarification and prevention of the criminality is based on planning, taking and using of the common criminalistics rules, means and methods, adjusted to the specific requests of each separate criminalistics methodology, which covers individual groups and criminal acts that are related to their similar ways of execution. Nonetheless, these groups of criminal acts

[32]Across the criminal process literature due to the change in the principle of *free judicial assurance* predominates the attitude that the question of classification of evidence nowadays is exceeded Sokolovik, S., Significance and justification of the classification of evidence in the modern criminal law JPKK, No. 2/1987. Aleksik. Z, as a criminalist he advocates the thesis that these differentiations have no justification on their own neither from legal nor from logical aspect. However, he thinks that from practical reasons, the division on personal and realistic (material) evidence looks like most acceptable. Criminalistics, Belgarde, 1982 p. 189

[33]Angeleski, M., Murgoski, B., Introduction to Criminalistics, Skopje, 2017, p. 191 - 204

[34]Criminal Law,Official Gazette of the Republic of Macedonia No.150 from 2010

whose criminal characteristics determine the nature and the core of each criminal methodology separately, and of course, not rarely, do not coincide with the criminal law classifications of criminal acts. In its essence, the criminal procedure is consecutive discovering of the objective facts and circumstances in relation to the criminal act, the perpetrator, the victim and other relevant circumstances in relation to the crime.

The criminal cognitive and heuristic activity is accomplished mainly along with the preceding (pre-investigative and investigative procedure), and along with the course of the criminal procedure as the only whole. The criminalistics research begins with a probability and with setting of a problem. In the science methodology it is talked on the perceiving of problems as a first phase in the research process and presentation which contains detection of the problem and its formation.The perceiving of the problem in a descriptive meaning represents part of heuristic criminal activity. Here, the facts (the base for suspicion) should be gathered on the basis of which the problem may be formulated, and then the further contents of the cognitive process follow: collection of the combined research, analysis of data and its assessment. With that, the cognitive core, the middle quadrum of the criminal research is: suspicion – truth – delusion – lie. According to this, the Criminal procedure is a developing constitutional structure based on a suspicion which ends with truth (or inability for its determination).

Cognitive structure of the criminal procedure

Suspiciontruth
Basics of suspicion → basic suspicion → factual conclusion
probability assurance (certainty)
pre-investigative procedure → investigation → main phase of the procedure

In its essence, the criminal procedure is a cognitive process in which in the initial phase there are isolated, unconnected data which are revealed and proved through consecutive (research based) activities; it enriches with new information, integrates in an integral whole changing its intensity and extensiveness up until the *level* at which it becomes a significant more, other: instead of probability – assurance, and instead of suspicion – truth.[35]

Within the criminal procedure, the investigation is the only process in which one thing comes from another. The high quality of detection and examination of the evidence-based information, facts, circumstances and the evidence needed for clarification of the crime and detection of the perpetrator, is possible only when it is secured only to the investigation – expediency of the investigation.

Actually, the process of detection of the previous (pre-investigative) criminal activity represents systematic and thorough approach towards the finding of latent and potential information and their decoding (deciphering)[36].

The success of the conduction of the plan for the investigation to a great extent, depends on its timely collection as well as the elasticity in the process of the conduction of the plan, i.e. ,adding changes timely. The main task on each plan is the investigation on the place of crime, as a cognitive, creative process, starting with its specificity in each given

[35]Pavišić,Berislav, Introduction to the criminalistics, Zagreb,2012, p.47.

criminal case, actually, it contains the following coherent elements: 1) determination of the cycle of circumstances and facts that have to be detected, clarified and proved (in alignment with the main inquiries of the criminology – subject of argumentation; 2) setting of different version of inquiries of the criminology; 3) determination and precision of the operational-tactical measures and investigative activities that have to be taken due to the determination of the criminal law relevant facts; 4) determination of the order and time of the execution of the operational-tactical measures and investigative activities; and 5) pre-assessment of the collected evidence and reasoning of which circumstances are detected and determined and which are yet to be detected and clarified.[37]

The assembly of the plan starts by comparing of all detected and caused facts (of material and personal nature), which are determined by the course of the *first try* and by creating of such versions (hypotheses, work assumptions, presumptions), which have to be based on realistic (objective) and verified facts. The *versions* are marked as one of many other possible interpretations of certain event and their number and diversity (plurality) represents a very important part of the very definition, and actually it represents their own "embryo" of the system of common and special versions. During the overall investigation, the *common versions* are assumptions of the subject of argumentation (thema probandi), the others are the *versions on the subject* (the subjective side – component) and the *object* (objective side – component) of the crime, while the special versions are assumptions (hypotheses) of the *evidence-based facts*. Namely, in the overall system of all given versions – the common versions play the role of their own "armature" (e.g., common version of accusation – guiltiness, common version of defense – innocence). The assumptions are the immediate and intermediate evidence (the truth of the evidence-based facts and the relation of the induction facts towards the subject of the argumentation) – which are called special versions, and they must be in accordance with the subject of the argumentation (common versions). The versions on the subject of the criminal act (who committed the crime?), on the subjective side of the criminal act (planned or accidental crime - what happened?), on the motives for the criminal act (why?), on the object of the criminal act (when or what?), on the objective side of the criminal act (the manner and means of committing – how? and what?) as well as the manner of the concealment of the criminal act, they all have the task to represent some kind of *binding tissue* between the common and the special versions.

During the criminalist-tactical activity (through full application of the three methods: the system of accumulation of the evidence, the method of diffusion – regarding negative facts and the method of elimination – exclusion), the relation of the inductions and the immediate evidence is completed above all in the way that each one of them and all together complete each other in the direction of the judgement i.e. they all confirm and eliminate certain version (hypothesis) and while doing that, not related to one another, they lead to the same fact (subject of argumentation - *thema probandi*). The subject of argumentation is that main – key fact through which all inductions and immediate evidence are mutually connected. For example, the fire and the smoke after the short circuit of electrical energy are not mutually and immediately connected, but through their mutual igniter (cause) – the short circuit, are like two consequences from the same reason. On the same side, the threat and the escape are mutually connected as links in the only system of

[37] V .Vodinelik, quoted, p. 29 - 38 and M. Angeleski, Criminalistics, NIO, Studentski zbor, Skopje, 1993, p. 49 - 67; B. Murgoki, Criminalistic processing of the traffic accidents, Faculty of security, Annual, 2009 p. 53 - 58

the criminal act, but only when that person really committed the crime. The assembly of the evidence is called *complex of evidence accumulation*. [38]

One case, taken isolated on its own, has no value of an evidence, and for it to be relevant evidence, it is necessary for two moments to be taken into consideration, i.e., the following should be determined: 1. In order for one case to be a material evidence, it is necessary its relation with the criminal act or with the perpetrator and the victim to be determined, because only then, this case may serve as an evidence. Because of this, while detecting of such cases, it is necessary to be recorded in minutes in a manner prescribed in the CPA to be stated, fixed and described, such as the place where it was found and in what relation is with the actual criminal law case; 2. An attention should be drawn and to be taken into account that all changes, i.e. that all cases may undergo changes and with that their quality suffers. In such cases, it is necessary certain measures to be taken to secure that case as evidence. i.e., all necessary measures should be taken for preservation. It is thought that the material evidence should not be looked as evidence mean which has advantage (prevalence) and a larger evidence value as opposed to the other evidence. In our legal system there is no such qualification of the evidence according to their evidence value, but on the contrary, all evidence is treated with the same attention and they are assessed by the court.

With the progress of technology a lot of advanced options for fast collection of huge amount of data is available which in the past were not available, and which the analysts can use them in their analysis of the cases in the judicial procedure. With the use of the modern devices, a lot of possibilities are enabled for formation of a multimedia data with a large scope of information and opportunities for implementation of larger number of later analysis, which should be able to lead to more quality analysis and large number of evidence. The fixation of the place of crime in the virtual world enables its easier reconstruction, verification of the witnesses' statements and testing of the given hypothesis on the crime.[39]

The *release* of the material evidence in the procedure is taken by determined process actions, such as: insight, reconstruction, the expertise and the recognition of faces and objects. With the help of such actions it comes to the data that gives the material evidence an enlightenment of important facts in the criminal case. The *evidence value* of the material evidence in the criminal procedure is assessed on the basis of the common rules on assessment of the evidence. However, wholly speaking, on the account of the value of this evidence, which is called "mute witnesses of the crime", it may be emphasized that, in their very nature, are objective and impartial.

4. STANDARDIZATION OF THE PROCEDURE FOR OWNING AN EVIDENCE CONTINUITY – THE CHAIN OF CUSTODY

In order for one case to be used as an evidence, it is necessary to be kept and not damaged (uncontaminated), to be properly transported, not to change its substance in the course of the criminal procedure, the place where it was found to be exactly registered and in what relation is with the argumentation case. Along with that, the chain of custody (chain of continuity of ownership of evidence) represents a standardized procedure of work

[38] V. Vodinelik, Criminalistics, 1984, p. 191 - 194

[39] K.Lipovac, I.Bjelovuk, M.Nesik, Collection of works, Law and forensics in the criminology, Kragujevac, 2010, p. 36

with material evidence with which the trail of the evidence is enabled from the moment of the securing of the place of the crime without contaminating and their fixating in the course of the insight, through managing and handling after it has been taken from the place of crime, transport (delivery), storage, treatment in the process of expertise, and up until court release in the course of the main hearing, as well as after that, keeping until the expiry date of the relevance of the evidence which is related to the actual criminal case. The overall process of work with material evidence must be supported with documentation and security measures in order numerous ways of manipulations to be disabled, forgery, damaging, destroying, or losing of evidence from the gathered evidence materials. Each phase from the treatment of the evidence must be supported by adequate documentation and signature of the authorized person. From the documentation of the evidence it must be clear where and when the evidence is found (in what condition), with application of what methods is founded and fixated, who and why had a contact with them in all phases of the procedure, way of packing, identification numbers, procedures and methods which had been used in the work with them, the storage conditions, security measures, who was responsible. In this direction, there are certain forms and also there are *standard procedures for treatment of the evidence-based data*. With the standardization of the chain of custody the evidence integrity is secured (assured), i.e., it justifies that the evidence presented in the court, is that evidence(authentic) which is detected and fixated in the course of the insight on the place of the committed crime. The illegally obtained evidence imply the facts themselves, or by the way it is gathered, as opposed to the constitutional provisions, it is not in alignment with the procedure for gathering evidence as prescribed in the CPA, as well as commonly accepted regulations from the international law and settled international contracts. The illegally obtained evidence, i.e. the evidence obtained in an illegal way cannot be used in the criminal procedure, it must be excluded from the evidence and sealed in a special package.

5. CONCLUDING CONSIDERATIONS

During the construction of the evidence building in the course of the pre-investigative and criminal procedure, it is thought that the only righteous strategic approach, when there is possibility for that, to pass on to the *combined evidence*, which contains the personal (individual) as well as realistic (material), and the immediate as well as the intermediate evidence. In that way, the separate pieces of evidence mutually complement each other and check, state and deny. Because of this, the combined evidence natural worth is to that extent as it is the worth of its segments.

In the course of the investigation, besides the positive facts and conditions, an equal attention should be paid to the so-called negative facts, which means not only the presence of something but the exiting traces and cases of the criminal act, and if one or the other contradict to the usual course of the act.

In the process of the criminalistics-forensic processing of the place of the crime on the part of the authorized and competent persons and teams during investigation, it is necessary to have a thorough and complete investigation and fixation of all relevant facts, cases and evidence which according to the stated standards it should be transported to the forensic labs for appropriate expertise. At the same time, during the investigation, the considerations of all given conditions and cases should be gathered which contributed to the creation of the criminal act through criminal and victimological analysis (relation between the perpetrator – victim). With that, all facts, evidence and cases should be

equally taken care of and investigated which go as a complementary to the defense and in addition to the accusation.

In the upcoming period, we think that the need of interdisciplinary and coordinated approach is necessary in the investigation of the criminal acts with the use of modern criminalistics-forensic methods and technics. In this context, we urge for consistent continuity and intensification of modern and continued process of training and increase of competencies in the field of forensics for the authorized institutions and subjects in the criminalistics and the field of security.

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SPECTROSCOPY AS A FORENSIC METHOD IN CRIMINALISTIC IDENTIFICATIONS

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Abstract

The methods used to determine the composition of a chemical substance or a mixture of substances is called chemical analysis. Chemical analysis of an unknown substance can be a qualitative and quantitative chemical analysis. With the help of qualitative chemical analysis, the composition based on the elements of the substance is determined, while the quantitative chemical composition determines the quantity of the substance, that is, the chemical compound or the mixture. There is no boundary between these two methods because the qualitative chemical analysis provides a certain quantitative ratio of the individual components.

Analyzes of the substances, as well as qualitative and quantitative analyzes, according to the methods of examination, can be chemical, physical-chemical and physical methods. According to the quantity of the test substance and method of operation, the qualitative chemical analysis can be performed according to one of the following methods: macro-chemical analysis, semi-micro or micro-chemical analysis, and ultra-microanalysis. Spectroscopy techniques can also provide methods of analysis.

In this article we will take a closer look at **spectroscopy.**Spectroscopic methods are physical methods by which qualitative and quantitative chemical analyses are performed for a short time and with high accuracy. These methods are based on the principle of studying the atomic spectra of the analyzed substances. Depending on the source of the applied radiation and the electromagnetic wave field, there are a number of spectroscopic techniques, which include: ultraviolet spectroscopy, visible spectroscopy, infrared spectroscopy, Raman spectroscopy, mass spectroscopy, spectroscopy of nuclear magnetic resonance.

Spectroscopic techniques serve to examine the wavelengths and the intensity of radiation that emit or absorb atoms and molecules under different physical conditions of radiation passing through the tested matter, which is in various forms and aggregate states. Depending on the technique of measurement, the source of radiation and the spectrum obtained, spectroscopy can be emission and absorption.

Key words: *method, spectroscopy,qualitative,quantitative, analysis, substances.*

1. INTRODUCTION

The method that is used to determine the composition of a chemical substance or a mixture of substances is called chemical analysis. Chemical analysis of an unknown substance can be a qualitative and quantitative chemical analysis.[40]

By means of a qualitative chemical analysis, the composition based on the elements of the substance is determined, while the quantitative chemical composition determines the quantity of the substance, that is, the chemical compound or mixture, with quantitative chemical analysis. There is no boundary between these two methods, because the qualitative chemical analysis provides a certain quantitative ratio of the individual components.

Analyses of the substances, as well as qualitative and quantitative analyzes, according to the methods of examination can be chemical, physical, or both chemical and physical methods.[41] According to the quantity of the test substance and method of operation, the qualitative chemical analysis can be performed according to one of the following methods: macro - chemical analysis, semi - micro, i.e. semi - micro or micro - chemical analysis and ultra - micro analysis.

The basic operations that are used for the analysis of the substance are the following: heating, evaporation, deposition, separation and washing of sludge. The sludge separation procedure is carried out in three ways: by centrifuging, filtering and decanting.

When analyzing the substance, the classification of the cations and anions in the appropriate analytical groups is carried out, according to the reactions which take place and the needed corresponding reagents. Classification of cations and anions by analytical groups is done for practical reasons.

2. SPECTROSCOPY METHODS

2.1. Emission spectroscopy

With the help of emission spectroscopy, tests are performed based on the study of the types and intensity of the radiation energy emitted by the analyzed substance. Radiation occurs as a consequence of the transition of electrons from atoms or molecules from the excited in the basic energy state, whereby a certain quantum of energy is emitted in the form of electromagnetic radiation. A source of electromagnetic radiation whose spectrum is observed is the test substance, which can emit electromagnetic waves only if it is heated at high temperature or under the influence of electrical and chemical stimuli. By analyzing the spectral distribution of the emitted radiation, elements based on their characteristic emission spectra can be identified. Determining the amount of a particular substance can be determined on the basis of the measurements of the intensity of the individual spectral lines or the total emitted radiation.

[40] Pleše M., Physics and chemistry of explosive materials, Ministry of defence of the Republic of Croatia, 2008, p. 459

[41] Daeid N. N., *„Explosive analysis theory“*, Department of pure and applied chemistry, University of Strathclude, 2003, p. 75.

2.2. Absorption spectroscopy

Absorption spectroscopy is a method that is based on the study of the type and amount of radiation energy that absorbs the investigated substation. Of the total radiation energy that is in contact with the tested substance, it absorbs only certain frequencies, that is, energy quanta that can cause changes in the energy state of the atoms, that is, the molecules of the substance, while the residual radiation is missed or reflected. At the places of absorbed individual wavelengths, dark lines appear in the resulting spectrum, which are called absorption spectra. Determining the wavelengths, or the absorption energy frequency, serves as a basis for qualitative analysis, while the amount of absorbed light serves for quantitative analysis.

3. TYPES OF SPECTRA

Emissions and absorption spectra are divided into continuous and discontinuous, molecular, rotary, vibrational. Continuous spectra are obtained by emitting radiation from heated solid bodies and liquid bodies. In these spectra, all wavelengths are present in a wider range of wavelengths, in which the visible sunlight belongs. Discontinuous spectra are composed of a large number of separate spectral lines, which can be linear and tape-like.

Line spectra are obtained from radiation emitted by ionized or non-ionized excited atoms located at a distance that, when radiating, acts independently of each other. Linear spectra yield only heated gases and vapors, thereby coming to skip the outer valence electrons of atoms on paths with higher energy levels. In these unstable excited energetic states, the electrons remain relatively short, then returning to the basic stable state. Each passage of an electron from a path with a higher energy level in a path with a lower energy level is accompanied by the emission of surplus energy in the form of electromagnetic radiation with a precisely determined wavelength. This type of radiation is located in the spectrum as a spectral line at a certain position and color. The tape spectra are derived from the radiation emitted by ionized or non-ionized excited molecules of heated gases and vapors whose temperature is not high enough to allow all molecules of the test substance to disintegrate into atoms and ions. This means that tape spectra are characteristic of the free molecules, which help determine the chemical composition of the test substance.

Molecular spectra can be emission and absorption resulting from changes in energy levels where the molecule absorbs or emits a certain amount of energy. When it comes to absorption, the molecule can absorb a certain quantum of light so that it passes from an equitable state of energy into a state of excitement with energy, because of the existence of atoms and molecules only in certain energy stationary states. This is the reason for the selective absorption of electromagnetic radiation.

As a result of the rotation of the molecule, rotational spectra appear and they are followed by changes in the rotational energy levels of the molecule. Each molecule that has more than one atom rotates and has a rotation axis. The biaxial linear molecule has two axes of rotation, while the triatomic and the multi-atomic nonlinear molecules have three axes of rotation that mutually overlap the right angles.

3.1. Ultraviolet (UV) and visible spectroscopy

The energy absorption is determined by the wavelength associated with the electronic transition from lower to higher energy level. This electronic passage is realized in the ultraviolet and visible spectral region.

Three types of instruments are used in the visible spectral range: colorimeters, photometers and spectrophotometers. If in the process of analysis the intensity of the color of a colored substance is measured in relation to the color of a solution with a known concentration, then it is a measuring technique called colorimetry, i.e. instruments that are called colorimeters are used. If the intensity of the light is measured, it is a technique called photometry, while the instruments are called photometers.

The spectrophotometer is a photometer that uses monochromatic light in the analysis process. The spectrophotometer measures the ratio of the intensity of the radiation to two beams in function of the wavelength of the random beam. It works on the principle of separation of the radiation according to the wavelength of electromagnetic rays that fall from the source of continuous radiation through the collimator to the dispersion system. Separate monochromatic rays at specified intervals, in narrow or wide strips, continuously fall on the test sample. The collimated rays using the detector register in the form of a spectrum according to their intensity in function of the wavelength.

A tungsten lamp is used as a source of continuous radiation, which has the task of continuously radiating electromagnetic waves in a wide range of wavelengths. In addition to tungsten, a hydrogen and deuterium lamp is also used. The lamps are made of quartz and are for use in the ultraviolet range. For quantitative spectroscopic analysis it is necessary to use monochromatic rays and therefore prisms, optical grids, absorption and interference filters are used. The use of the prism in these techniques is to disperse polychrome radiation in the spectrum of monochromatic rays. In visible and ultraviolet spectroscopy different types of prisms are used, depending on the wavelengths the spectrometer operates. For this purpose, optical-glass prisms are used for the visible part of the spectrum, while quartz prisms are used for ultraviolet, visible and near-infrared areas. Photo detectors equipped with photocells and photomultipliers are used as detectors. Modern spectrophotometers are connected to personal computers with software support for complete spectrum processing to final results.

3.2. Infrared spectroscopy

Infrared spectroscopy is used to test the vibrational and rotational passages in the molecules of an organic compound. When examining the infrared spectra, the investigated samples in the spectrometer are subjected to continuous change of wavelengths with wavelengths, and for certain wavelengths the absorption of part of the infrared radiation that induces certain energy levels in the molecules of the test arises. The absorption of infrared radiation, depending on the wavelength, gives the graphic representation of the infrared spectrum of the test substance. Infrared spectra can be recorded on samples found in all aggregate states and depending on the same, the amount of sample for analysis is usually from 1 to 10 mg.

The capture of the gas samples is performed in glass or metal cells with a length of 1 to 10 cm, at the side ends of which are optical polar plates of sodium chloride NaCl through which the infrared ray enters and leaves.

The examination of liquid samples is performed either as pure solvents or as solutions and their recording is carried out in special cells, the so-called cubes with thickness of the walls from 0,01 to 1 mm. Cells of the cell are made of optical polar crystals of sodium chloride NaCl and potassium bromide KBr. If water-containing or other substances reacting with sodium chloride NaCl and potassium bromide KBr are used in working processes, more resistant plates made of silver chloride AgCl, arsenic trioxide As_2O_3 and the like are used. Often, the cells in the cells can be cooled, allowing a fine adjustment of their thickness with the help of metal brackets.

The testing of solid specimens is carried out most often in the form of a paste or pressed ampoule, that is, a tablet. The thickness of the solid layer is 0,1 to 1 mm. The test sample first leads to a fine state of powder, and then tablets or dense pastes are prepared from it. For their preparation, 1 to 2 mg of the test sample is washed and mixed with 100 to 130 mg fine potassium bromide KBr powder and the resulting mixture is pressed into molds under vacuum. Potassium bromide KBr is added to the mixture, which makes it transparent in the infrared range and does not affect the spectrum of the test sample. To obtain a test which is then used as a dense paste, 2 mg of the powdery sample is mixed with 1 to 2 drops of paraffin oil. The resulting paste is applied as a thin film on the carrier which is placed between two optically polished NaCl chloride plates.

The infrared spectrophotometers are composed of three basic parts:

- a source of radiation;
- monochromator and
- detector.

Suitable sources of radiation are heat-treated bodies that are heated to a temperature of 1273,15 to 2073,15 K. The emitted spectrum is continuous and covers the entire infrared range. The most commonly used source of radiation is the non-porous fiber, which is an alloy of 80% zirconium dioxide ZrO_2, 10% thorium dioxide ThO_2 and 10% other components, i.e. magnesium oxide Mg, calcium Ca and cesium Cs.

The basic role of the monochromator is the selection of separate, approximately equal monochromatic waves arising from the continuous radiation of the source of the infrared spectrum. Examples of lithium fluoride LiF, sodium chloride NaCl, potassium bromide KBr are used as monochromators in infrared spectrometers, rarely used cesium iodide CsJ prisms.

For detection of infrared radiation, thermal detectors are used, which cover the whole range of the infrared spectrum. An infrared spectrometer is used that uses two parallel beams, one of which is working and passing through the measurement sample, and the second is reference and passes through the reference sample and is most commonly used and used for qualitative analysis.

From the recent generation of infrared spectrometers, the so-called FTIR spectrometers, in whose instrument two methods of analysis are combined, and this is a physical method, the so-called interferometry and mathematics, the so-called Fourier transform. The basic principle of work is interferometry and obtaining an interferogram, which with the help of computer processing; the so-called Fourier transformation is further translated into the usual form of spectrum. These spectrometers have an advantage over others, because it allows fast spectral capture, higher sensitivity, multiple sampling capability, resolution up to 0,1 cm and easy processing of the spectra obtained.

The display of infrared spectra takes place in the coordinate system by applying the wavelength of the abscissa and the transparency or absorption of the ordinate. The infrared range is located in a wavelength range of 780 to 5000 nm with a division of three areas: close, intermediate and distant. In the near infrared, there is little radiation absorption, which originates from the basic vibrations. In the middle region there is a stronger absorption with a value between 200 and 4000 nm and here intense strips of basic vibrations are dominant. In the far infrared wavelength range larger than 4000 nm there are only some of the fundamental vibrations of molecules. The interpretation of the infrared spectra is based on the position, intensity and shape of the individual strips obtained when recording the test sample.

4. MASS SPECTROMETRY

Mass spectrometry is a method of working on the production of positively charged gas ions from the sampled sample, their separation by mass and charge and their registration according to the type and quantity of the ions. This method is very well applied in the identification of various explosive substances, even when they are traces, or when detected during exploration after the explosion occurred. In mass spectrometry, the sample is ionized and then the spectrum is recorded. For most mass spectrometers, the samples are analyzed in the gas phase, where the organic phase is continuously added to the ionizer through a small aperture, unless the mass spectrometer continues in gas chromatography.

The mass spectrometer consists of a test preparation system, a sample test system, an ion source, a magnetic analyzer, a detector, and an analyzer. The principle of operation is by introducing a sample for analysis in the gas phase, its ionization in the ionization chamber, separation of the formed ions under the action of a magnetic field and their registration according to the size of their mass and their electricization.

In the system for preparation of the test, its evaporation and enrichment is carried out, if necessary, an isotope fraction is carried out. In this way, the prepared sample is introduced under vacuum in the mass spectrometer system. In the ion source molecules, under the action of electrons, produce positively charged ions, which, with the help of a variable magnetic field, direct themselves to a magnetic analyzer where detection of a certain ionic species with a definite ratio of the mass of the charged ions (m) and the number of charged ions (e).

In order to be able to register a quantitatively determined type of ions, it is necessary on its way through the mass spectrometer, from the ion source to the detector that the ions do not collide with other molecules or ions. This is only possible if there is a high vacuum in the ion source, analyzer and detector from 1/1000 to 1/100000 Pa.

The system for introducing the sample into the mass spectrometer consists of a number of rotary and diffuser pumps and valves, which allows partial interruption and establishment of certain pressure in various parts of the system. The sample inserted in the mass instrument shall be in the gaseous state in order to carry out the ionization of the sample.

The Ionian source has a task to perform the ionization of the test. There are many types of ion sources:

- ionization with electrons;
- chemical ionization;
- Ionization with arcing.

The ionization with electron is most commonly used. Mass spectra are recorded in a two-dimensional coordinate system in the form of peaks.

4.1. Mass spectrum of trinitrotoluene (TNT)

In the paper we will displayed mass spectra of TNT as one of the most explosive substances most identified when illuminating the crimes on the territory of the Republic of Macedonia, while ignoring other explosive substances that are less identified, but are still part of a criminal - legal event, such as commercial explosive substances (ammonix, amatol, ammonal, C - 2 and others) which are mixtures and are made on the basis of ammonia nitrate, trinitrotoluene (TNT) and other accessories, then hexogen (RDX), pentrite (PENT), picric acid, dynamite, ammonium nitrate and other.

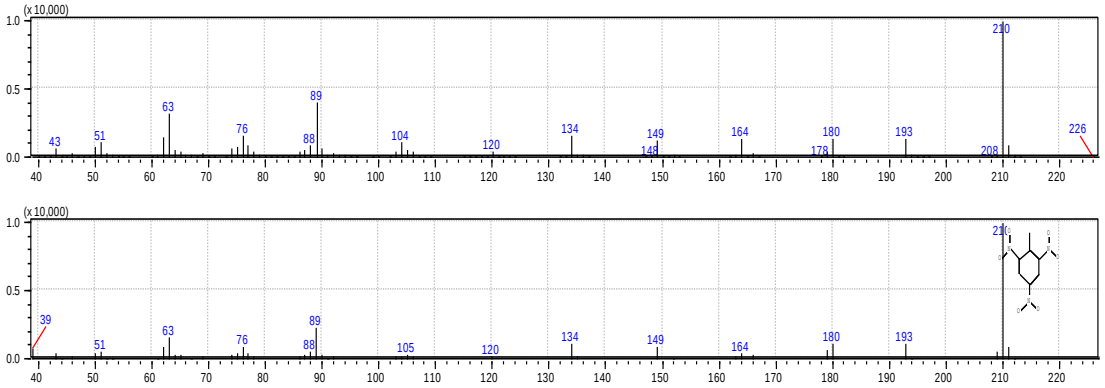

Figure 1. Mass spectrum of TNT (sample-up, reference-down)

In the mass spectrum of trinitrotoluene (TNT) obtained by electron-collision ionization (EI), a peak of the quasi-molecular ion of m/z 226 at very low intensity is observed. The basic peak in the mass spectrum is that of m/z 210, with this trinitrotoluene (TNT) of m z 227 losing the hydroxyl radical M - OH, i.e. 227 - (16 + 1). The ions of m/z 193, 180 and 164 in the collision of electrons in the EI mass spectrum of TNT are formed by losing the second hydroxyl, NO and NO_2 radical, respectively. With the loss of $3NO_2$, i.e. $(M - 3NO_2)^+$, it turns into an ion with m/z 89 (M - 3x36). The resulting mass spectrum of TNT coincides with the reference spectrum of TNTs from the database.[42]

[42]http://www.detonit.mk/category/explosivesaccessed on 21.05.2015.

5. CONCLUSION

The use of methods for detecting and clarifying criminal events from a forensic aspect is undoubtedly an important goal of today's society. People who professionally deal with the clarification of crimes are caught up in the situational events that occur every day and usually try to find solutions that could solve the challenges. The discovery of crime would be the perfect solution that could solve an infinite number of problems. By means of qualitative chemical analysis, the composition based on the elements of the substance is determined, while the quantitative chemical composition determines the quantity of the substance, that is, the chemical compound or mixture, with quantitative chemical analysis. The most sophisticated methods and tools, i.e. instruments related to the detection and detection of explosives, are related to the resolution of the crimes committed by the use of explosive materials, which caused an explosion and enormous material damage and human casualties. In fact, it begins with the collection of evidence from the scene in order to investigate the traces of explosions as well as unexploded ordnance, regardless of whether it is improvised or fabricated explosive devices.

Evidence material, i.e., the traces of the criminal act, is a criminalistic feature of the crimes. Starting from the regularities and specifics of the occurrence, fixation and use of criminal information for detecting and clarifying the crime, they are realized through the discovery of the causal links and influences, the dynamic relations and laws that certainly exist in every criminal event. With the occurrence of criminal acts, traces of the same can be found which can be found at the scene. The traces themselves represent an important part in the analysis and research of explosive materials as part of criminal action.The methods used for forensic analysis and exploration of explosive materials in the Republic of Macedonia, including spectroscopy, fall into the category of fast, simple, non-destructive, but precise and reliable methods. The funds, that is, the instruments available to the Department of Criminalistic Techniques at the Ministry of the Interior - Micro Tracks Department are one of the most modern instruments and they give high accuracy to the tested samples when using them.

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OPEN SOURCE COMPUTER FORENSICS TECHNOLOGIES

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ABSTRACT

Millions of people are connected around the world with game consoles, smart TVs, mobile devices and internet of things (IoT). Speed and time are the driving force of substantial data which is produced within this network. Cyber network spreading beyond the borders of governments is a challenge along with the emerging technologies. This paper studies the architectures, frameworks and methods and focuses on categorization, concepts and how open source technology contributes to computer forensics. Categorization facilitates the work of computer forensics analysts in directing and specifying the conceptualization guide through the computer forensic life cycle. The media and the software on which data is transmitted shape the forensic terms and fields. The need for infrastructure to host specialized hardware and computer forensic software is also discussed.

Keywords: *Computer forensics, open source, framework, architecture*

1. INTRODUCTION

In our daily life we have started seeing devices getting smarter. The extent of this development varies from smart phones to smart cities. Devices gradually become robots. People speak to their phones and organize their daily activities. Emotional intelligence and artificial intelligence are seen on the horizon between people and devices. As chip size is getting smaller, devices are getting smarter. This growing space in the new cyber world reaches to astronauts who are sending tweets from space. In this domain, all communication is achieved through the internet. At the same time, the internet is becoming like a water or electricity bill to people. It is becoming part of our daily life. Bring your device-BYOD technologies create diversity in the access to internet on device level and Internet of things-IoT technology broadens internet`s current space with its own network. Day by day new technologies are integrated in the current internet domain. Apart from its benefits for civilization, the internet is a space that is becoming a crime scene in human's daily life. Changes are so fast that it becomes a burden to the law enforcement units. The borders between computer security professionals and forensics analysts disappear in some cases. Information gained by training or certification and knowledge gained by experience struggle to catch the momentum along those technologies and developments. Criminals in this extending cyber space adopt methods quickly. Software whether embedded or not stands in the center.

Two types of software are used regardless of their aims in specific fields. Commercial products are treated as proprietary or closed software. The code of software is not open due to commercial regulations. Open source software is open to review and is developed under public licenses. Both software products are used for collecting and

analyzing digital evidence in digital crime scene investigation. Closed software can be assumed as a black box and open software as a white box in terms of software testing.

The same analogy is used for testing purposes. Closed software is viewed based on the assumption that it produces what it is supposed to. There is no standard way of testing the reliability of such software. Vendors of closed software regularly publish patches, updates, upgrades, fixes to recover software, to resolve bugs and security vulnerabilities. At some point vendors announce a stop to their support. On the other hand, all open source software checks and developments are done under public eye as it is based on peer-to-peer and distributed scrutiny. This results in transparency, huge number of testing and reviewing which brings quality of testing and increases reliability. The motivation behind developing software is different for software being closed or open[43]. Commercial concerns related to closed software are not applied to the open source software. Open source software is not free. Open source software license is different from free software license in regulating accessing, changing and sharing source code. Open source software license might be designed to protect the author and rights when delivering the source code. There are several types of open source software licenses. Companies like Microsoft use different naming but might be considered as open source ("Microsoft | Shared Source Initiative," n.d.). Allowing source code reviewing, auditing and developing under new umbrella licensing by companies is regarded as open source by the open source initiative and accepted as free software license ("gnu.org," n.d.)by free software foundations. Such initiatives taken by companies show the willingness of companies to take part in the open source field. Companies tend to acquire open source projects, for example, as Oracle purchasing the Sun ("Oracle Buys Sun," n.d.). This can be seen as companies try to manage their research and development activities through open source project initiatives. Compared to the fees paid to get technical support for commercial products after their sale, the companies want to see their research and development investments compensated. Some fields might be seen as conservative such as banks starting open source projects, like Deutsche Bank when it makes a product open ("Deutsche Bank makes its computer code publicly available for the first time – Newsroom," n.d.).

2. MATERIALS AND METHODS

In open source technology a developer can review all codes and make a contribution on the condition of making all codes open to everybody. For closed software users are expected to wait for discovery of vulnerabilities or bugs. There is no promise to fix problems in terms of time. All processes happen behind commercially closed doors. Open source software is public and everything is known to the public. The risks of using open source software are anticipated and calculated. The courts sentence people with the help of digital evidence. The extent of the sentence is not the subject of this paper as the regulations vary depending on the law applied in the country. For explanatory purposes, let us assume a case in which the X commercial forensics software produces a result to gauge digital evidence. What happens after the vendor publishes a fix after some time for a discovered bug in the X software that corrects the result that had been used to gauge digital evidence? The professional forensics analyst may not be aware of the risks produced by the X software while working in the crime scene investigation. Transparency

[43] (Open Source Initiative, 2010)

imposes the checks and balances on the risks to gauge digital evidence. Being open to the public eye brings the advantage of continuous checks to become aware of emerging risks to the digital crime scene investigation 44. Companies generally publish products on their websites for users to test for a specific period time which is called a trial version or a demo. Digital forensics products tend not to have such options for users due to certain commercial reasons.

From architectural point of view, open source forensics software can be classified as applications, frameworks, bundles and cloud. The applications may have standalone, client-server or n-tiered architecture. These applications exist in portable formats or are integrated with 3r party applications. The Sleuth Kit[45] is used for investigating disks which is categorized in deleted file recovery in NIST's computer forensics tool catalog[46]. Applications in either portable or standalone format can help the forensics analyst to avoid technical issues such as dependency problems regarding the platform and the operating system. Running an application without installing on windows or derivative of Unix systems may help professionals work cross-platform which defines the borders of the digital crime scene. Frameworks are bases to host applications through integration and development. Frameworks help professionals add existing forensics applications and customize the platform to have an application that already exists. Frameworks give flexibility to adapt the new tools, applications and technologies. Being generic is seen as an advantage to extend the usability and benefit of the architecture that hosts forensic technologies. Compatibility and maintenance cover all software that the framework hosts. If required, dismantling a software provides the flexibility to extend its lifecycle. The Open Computer Forensics Architecture-OCFA[47] is built by the Dutch National Police[48]. In this sample it is seen that outputs of commercial products such as EnCase ("EnCase Forensic Software - Top Digital Investigations Solution," n.d.)are used by open source tools in this framework. The other way around would help the professionals have more choices as well. The frameworks can be considered as a base for building a digital forensics laboratory for forensics purposes, as well as training. Bundles are mostly hardened or customized open source operating systems which come in different medias like CD, DVD or USB. Bundles are delivered mostly with hardware or electronic devices or as part of a software package. Pre-installed software is such a bundle that is delivered with new devices. The preceding term "live" for media is used as those bundles are used externally and booted without the need to power off systems that they are attached to. Open source operating systems are customized to host applications to serve for specific purposes like forensics. Those bundles give an advantage to forensics analysts while working in a digital crime scene as isolation is given from the system that the analysts are working on. Without the right to write, but just read, the professionals who work on hardware are enabled to have this isolation for bundles. USB drives are easy to carry while working on the digital crime scene and the bundle is hardened in order to allocate all resources of the operating systems for a specific purpose. Caine[49] is realized from Ubuntu Linux which is a computer forensics Linux live distro. USB formats are more

44 (Kenneally, 2001)
45 ("The Sleuth Kit," n.d.)
46 (National Institute of Standards and Technology (NIST), 2014)
47 ("Open Computer Forensics Architecture," n.d.)
48 ("Politie.nl," n.d.)
49 ("CAINE Live USB/DVD - computer forensics digital forensics," n.d.)

helpful than CD/DVD formats in working in a digital crime scene. USB formats vary in shapes such as the pen for easy use. The cloud technology creates abstraction between users and the location of the application that the users run it on. Open source software in cloud technologies is used to build cloud platforms like OpenStack[50], OpenNebula[51].

There are growing business models, such as private and public clouds. Web application and desktop applications can run in a cloud environment and the users only need an internet connection for cloud applications. In accordance with the business models, new cloud services are emerging; Infrastructure as a Service-IaaS, Platform as a Service-PaaS, Software as a Service-SaaS are among the widely known. In addition to these cloud services, Forensics as a Service-FaaS[52] is now being presented to meet the forensics demands. There is no standardization in naming as-a-Service products yet. What brings FaaS into cloud is the scale of data being processed on the internet which is relying on big data technology. FaaS is the result of large data. Forensics analysts cannot build digital forensics laboratories to collect and maintain the amount of data that big data holds. This might help forensic analysts in the use of diverse devices in the field in order to do their job, such as smartphones, tablets or personal computers. The internet connection might be a problem for use. Asynchronous connection might help overcome this obstacle. FaaS is expected to solve the capacity problem and post-forensics activities such as archiving imaging. As the archive grows, the investigation capability is increased with open source tools for big data. The Sleuth Kit's plans with Hadoop can be considered on cloud as a FaaS. Cloud is growing with virtualization. This means FaaS physically does not need physical devices to serve forensics analysts. Virtualization allows cost-effective investments to meet business requirements. As virtualization and cloud serve digital forensics investigations they become a crime scene as well.

The National Institute of Standards and Technology-NIST[53] runs the Computer Forensics Tool Testing-CFTT project. NIST does not make separation between open and closed software. If you look into some of the tests, supportive software code can be viewed. There is no mention regarding the open source license. Testing closed forensics software products with open source testing software leads us to ask whether testing in another way increases transparency and trustworthiness. This is an advantage over closed commercial forensics tools[54]. NIST runs the Computer Forensic Tool Catalog[55] to help forensics practitioners find a suitable tool for their needs.

3. RESULTS

Open source is useful for training purposes. There are bachelor degree programs in computer science departments at universities where computer forensics is taught with open source tools. The point is to make forensics analysts not just consumers of closed commercial tools, but to get them understand what is behind closed doors and make contributions in the future. There are certification programs where commercial closed programs or product-specific trainings for forensics analysts are used. The risk is that in

50 (OpenStack.org, 2014)
51 ("OpenNebula – Flexible Enterprise Cloud Made Simple," n.d.)
52 (Wen, Man, Le, & Shi, 2013)
53 (NIST, 2003)
54 (Decusatis, Carranza, Ngaide, Zafar, & Landaez, 2015)
55 (National Institute of Standards and Technology (NIST), 2014)

this wide and new emerging field there is a chance that practitioners are restricted in a closed area[56].

Another concern is that there are product-specific open source forensics tools. The life time of those tools depends on their market share and their usage. When it comes to smart phones, the speed of change affects those tools as well. Some models disappear in time and along with the specific product-based computer forensics tool. However, from a futuristic perspective, producing more generic open source forensics tool will be useful. When IPD parser for blackberry is reviewed on the black duck, the last undertaken activity on the source code was seen in 2009. In the same research, the blackberry market share was mentioned in the statistical data of 2007[57].

The reliability of forensics software is measured by transparency, openness and widely distributed testing. In other work comparing open source forensics tools with commercial tools, findings show that open source tools might have advantages over the closed tools. For instance, EnCase tool does not log the forensics analyst actions although others do. This is important to show in court that there is no internal tampering with digital evidence. Open source forensics tools can be used to validate closed forensics tool work. This will give assurance to overcome the concerns over the closed source code and increase the trustworthiness of the code. The aim should not be the user's experience with forensics tools, but whether these tools are verifiable and trustworthy. Especially since justice is brought by means of these tools and their results[58].

When open forensics tools increase the validation in digital forensics investigation (DFI) processes, the competency of forensics analysts' also increases the soundness of digital forensics readiness. Digital Forensics Readiness is a pre-incident plan that resolves the conflict between business continuity and digital forensics investigation as validation maximizes the digital evidence usage and the confidence in the forensics analyst open source tools, contributing to digital forensics readiness[59]. In one research, in order to develop a model for digital investigation under the Ubiquitous Computing environment, open source software was used to deal with the obfuscations. In this research, open source computer forensics software is scientifically used to build a model for digital forensics investigation regardless of whether the participating software is closed or open[60]. With the development of big data there is a need to process big data for DFI purposes. In this sense, open source software like Hadoop is used in distributed manner to process massive digital forensics collections. This takes traditional open source computer forensics tools to cloud[61].

4. DISCUSSIONS

Digital crime scene investigation is different from the traditional crime scene. The barrier is set between real world and cyber space. The lifespan of the software is determined by the usage on the market. Throughout this lifespan, the software is sometimes terminated or upgraded. Being closed or open does not have an effect on

56 (Huebner, Bem, & Cheung, 2010)
57 (Fairbanks, Atreya, & Owen, 2009)
58 (Manson et al., 2007)
59 (Mouhtaropoulos, Li, & Grobler, 2014)
60 (Chu, Deng, & Chao, 2011)
61 (Roussev, Wang, Richard, & Marziale, 2009)

termination. As software is a continuous activity in its form, open source is a progressive activity broadened by the contribution of volunteers and distributed architecture. Beyond the existing commercial concerns and mostly driven by research-and-development motivation, the open source code improves the criteria of digital evidence in cyber space. This new domain goes beyond the traditional evidence criteria and crime scene investigations as it develops day by day. Digital forensics readiness and digital triage are necessities for both the private and public domains when dealing with the security and forensics requirement.

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SOURCES OF MATERIAL EVIDENCE IN THE PROCEDURE FOR DETECTION OF CLANDESTINE LABORATORIES FOR THE MANUFACTURE OF SYNTHETIC DRUGS

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Abstract

The number of clandestine laboratories discovered in Serbia and in the neighboring countries, and the amount of confiscated synthetic drugs and precursors exceed all previous seizures in the criminal scene. Nevertheless, there is still not enough attention given to these types of drugs, unlike other "natural" drugs. From a criminalistic point of view, but also from the aspect of safety and environmental protection, it is necessary to know the method of discovering and dismantling clandestine labs for the manufacture of drugs and to standardize security measures at the scene of the criminal event. When entering the laboratories, the police must take into account the risks that exist on the spot due to the presence of various chemicals that are often poisonous and flammable. Various vapors can cause damage to the eyes, the skin, the nervous and respiratory system, while some substances often cause explosions in reaction with the air or other chemicals.

The paper is particularly concerned with the police procedures at the crime scene, with particular reference to the sources of material evidence, because in practice it has become evident that personal evidence is rare and unreliable.

Key words: *manufacture, synthetic drugs, clandestine laboratories, precursors, equipment, evidence.*

INTRODUCTION

Numerous researches indicate that the interest for synthetic drugs among the young population has been constantly growing, leading to future expectations that a certain number of synthetic drugs will "squeeze out" some drugs of natural origin. There are many reasons for such expectations. Namely, synthetic drugs are being relatively easily manufactured in any place and in improvised conditions (Yi Nin Chiu et.al., 2011:356),[62] its manufacture does not require a lot of manual labor, it can be manufactured regardless of the weather conditions which are needed for growing plants used for natural drugs

[62] In houses, flats, basements, abandoned halls, rented warehouse facilities, farms, hotel rooms, bicycle repair shops and other venues.

manufacture, they are manufactured on the spot, near the consumers, thus smuggling across state borders is avoided. The first clandestine laboratories for the manufacture of synthetic drugs were discovered in mid 80`s in Germany, then in the Netherlands, Denmark, Luxembourg, Poland and later in many other countries of the European Union (hereinafter: the EU).[63] The first laboratory for the manufacture of synthetic drugs in Serbia was discovered in 2003 and, as it turned out, the largest discovered illicit laboratory in the Balkans to date. The main organizer of this manufacture was Milan Zarubica, Doctor of Pharmacy, owner of the company "Lenal Pharm".[64]

Having served a sentence of 11.5 years, Milan Zarubica got arrested again in 2017 for the organization of synthetic drugs manufacture in Tetovo, Macedonia. The action was performed by a joint team of Macedonian and Serbian members of the respective Prosecutor`s Offices for Organized Crime in cooperation with the police forces of both states. On that particular occasion, eight members of the organized criminal group were arrested, citizens of Macedonia and Serbia, who have been long involved in a manufacture and trafficking of synthetic amphetamine drugs. They have installed an illicit laboratory for synthetic drugs manufacture in Tetovo, with a separate tablet pressing line. In this particular action, 300 kilograms of amphetamine tablets were seized.

As experts state, due to their low cost and easy access, these particular drugs will prevail in the XXI century. Their manufacture, trafficking and trade are a lucrative business and one of the main parts of the organized crime machinery. If you add to this the fact that the young population will most likely be the first to try the latest drugs available on the narcotic market, then the social danger is even greater (Otasevic, 2008: 58).

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[63]BELGIUM: Europe`s largest narcotics laboratory destroyed, available at: http://www.telegraf.rs/vesti/814071-belgija-unistena-najveca-laboratorija-narkotika-u-evropi

[64]In a police action that lasted for almost a year, 10.000 ecstasy tablets were seized – MDMA (Methylenedioxymethamphetamine) and approximately 20 tons of Amphetamine Sulfate – compound for ecstasy production, in a total value of 10 million euros, while the value of the discovered "pharmaceutical" machines was slightly smaller. The police from Belgrade arrested 13 individuals and some of them were owners or authorized persons in the following companies: "Lenal Pharm", "Varan Chemical", "Varan Pharmaceutical", "Kimil Trading Company LTD Cyprus", "Ecoengeneering", etc. The first suspect M.Z. purchased precursors for synthetic drug manufacture from these companies and used them for drug manufacture in his own factory. The entire manufacture process was conducted based on the recipe of M.Z. and one of the actual manufacturers was a person holding M.A. degree in physical chemistry. Some estimates indicate that since 2000 until the discovery and the arrest in March 2003, this well organized criminal group managed to produce 31.200,000 ecstasy tablets and that the potential profit of this synthetic drug manufacture and the sale exceeded 50 million euros. Ecstasy tablets were manufactured on professional production lines and packed into boxes with false declaration, which facilitated the drug distribution to the illicit drug market. The results of the police action which was simultaneously performed in 35 facilities in Nova Pazova, Simanovci, Vrcin and Belgrade have shocked the general public which did not suspect at all that such modern laboratories for drug manufacture exist in our country. M.Z. was charged for drug manufacture and other drug related acts and was sentenced to 11.5 years in prison. His property, the facility and the equipment of "Lenal Pharm" were confiscated, along with 320.000 USD and 89.000 EUR found in his possession and 2.5 CHF from the bank account in Switzerland, he also had to deposit 10 million USD to the state budget account, due to his illegally acquired assets. In: Data of The Department for Analytics of The Ministry of Interior of the Republic of Serbia.

For illustration, in the period 2003-2017, as a result of operational police work, 10 narcotic laboratories involved in illicit manufacture of synthetic drugs were discovered, 93 laboratories for marihuana manufacture (of different manufacture capacities and different quality of equipment), and one illicit laboratory for the manufacture of the hallucinogenic mushrooms of the "Psilocin" family.[65]

In the reporting period, most of the illicit laboratories for the manufacture of synthetic drugs were discovered in Belgrade and its surroundings (Stara Pazova), in total 8, one illicit laboratory in Novi Sad and one in Dimitrovgrad. Out of 10 discovered laboratories, 7 were involved in illicit amphetamine manufacture, 2 in illicit ecstasy manufacture and 1 in manufacture of a designer drug called methaqualone. Out of 8 illicit laboratories discovered in Belgrade, two were discovered in the narrow city core, while 6 were located in the outskirts of the city. Two laboratories were installed in apartments, while 8 were installed in specially equipped premises. The laboratories had been very lucrative and its manufacture capacities exceeded the needs of the Serbian narcotic market.

DISCOVERING CLANDESTINE LABORATORIES

Nowadays there are no standardized methods for discovering the clandestine laboratories and providing necessary evidence for the successful conduct of criminal proceedings, i.e. there are only domestic and international experiences and personal impressions of the police officers involved in affairs of suppression of the illicit manufacture of synthetic drugs. In a world of growing connections, where organized crime and its offenders do not recognize state borders, it is utterly important for the police officers to be introduced to the international experience in the fight against the illicit manufacture of synthetic drugs. In specific, this kind of experience can be successfully applied in domestic practice, as long as the operational measures and actions, along with the evidentiary actions, are being adjusted to the concrete circumstances of a case and applied accordingly on the basis of timely composed and reliable analyses.

During actions aimed at locating the illicit labs and collecting, finding and securing the evidence, the law enforcement officers must be extremely cautious as they can face: hidden traps, individuals prone to armed resistance or use of various chemicals as weapons, air polluted with solvents and chemicals, hydrogen gas exploding when it comes in touch with air, and other corrosive, flammable, toxic and explosive substances.[66]

Thus, emplying police–intelligence work, it is very important for the police forces to timely identify and consequently put under control the individuals who are designated as potential criminals in regards of illicit manufacture and trade of synthetic drugs (Manojlovic, 2008:17).

Based on the conducted analyses, it is important to determine which type of illicit laboratories were most common in our country and the region, the type of drugs manufactured, the quantity and the manufacture capacities of the discovered labs.

[65] Data of The Department for Analytics of The Ministry of Interior of the Republic of Serbia.

[66] More at: Practical Guidance for Crime Scene Investigation, The Swedish National Forensic Laboratory (SNLFS), second extended edition, adapted by The Police Secondary School, Danilovgrad, 2002. page 41.

For future efficient fight against this problem, it is necessary to analyze the following information:

- how many labs, in total, have been discovered;
- whether the labs have been discovered as a result of operational police work, regular police activities or after the explosions;
- which chemical methods have been used;
- whether primitive or sophisticated equipment has been used;
- whether the labs were located in rural, suburban or urban areas;
- venue of the labs – an open space or a closed facility – what was the type of the facility: house, apartment, rented warehouse, farm;
- whether all manufacture stages were performed at the same location;
- whether the manufacture and trade were carried out in the same country;
- to what extent were the labs profitable;
- whether there was any resistance during the arrest;
- whether there were any "traps" set up for the police officers during the entry, etc. (Otasevic, Atanasov, 2011:40).

How to discover illicit manufacture of synthetic drugs based on used chemicals

In order to suppress the illicit manufacture and trade of synthetic drugs, it is necessary to have control over the manufacture subjects (precursor substances and technology), research institutions (their precursor substances and lab equipment), import, export and trafficking of precursors and the used equipment. To be more exact, it is necessary to establish and develop intense cooperation with all subjects, both on domestic and international level, who have jurisdiction in the manufacture and trafficking of precursors, control the trafficking of precursors and keep precise registration records on the cross-border trafficking of precursors (Milosevic, 2010:122).

Proper control implies confirmation that the substances and the quantities ordered are in accordance with the buyer`s needs. It is necessary to identify states with excessive import or with periodical rise of import, which might indicate the misuse of precursors, and based on the info, enable the intervention with the states in which these malversations occur, thus suspending the excessive import. Drug dealers target the states which generally do not have proper mechanisms to registrate such illicit transactions on time. However, instead of substances designated in the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988, drug dealers often use analogues as replacements, especially when it comes to "designer drugs".[67] By changing its chemical composition, criminals produce new psychotropic substances which avoid classification as illicit and are conditionally considered as legal, which additionally hampers their detection.

According to the aforementioned, it can be concluded that one of the ways for discovering clandestine labs is to monitor the trafficking of chemicals needed for synthetic drug manufacture. When it is revealed that a specific individual is in possession of certain

[67]Law on Ratification of the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, *Official Gazette of the SFRY*,no. 14/90.

chemicals, judging just by the specific kind of chemicals, it is possible to conclude what he/she intends to do with it, i.e. which drug can be manufactured in illicit conditions. If there are strong control mechanisms of the trafficking of chemicals, then the manufacturers will not have an easy access to substances needed for the manufacture of synthetic drugs, which disables or at least hinders their illicit activities.Such control was embraced by the United Nations and many countries with illicit drug laboratories. Hence, the tables of chemicals used for narcotic drug manufacture have been designed to that end (Table 1 and Table 2).

Table 1 lists substances usually used for manufacture of narcotic drugs, rarely used for other purposes (N-Acetylanthranilic acid, Ephedrine, Ergometrine, Ergotamine, Isosafrole, Lysergic acid,3,4-Methylenedioxyphenyl-2propanone, 1-Phenyl-2-propanone,Piperonal, Pseudoephedrine, Safrole). Table 2 lists substances usually used for manufacture of narcotic drugs, often used for products of mass manufacture. These are: Acetic anhydride, Acetone, Anthranilic acid, Ethyl ether, Hydrochloric acid, Methyl ethyl ketone, Phenylacetic acid, Piperidine, Potassium permanganate, Sulfuric acid, Toluene.

If an individual provides or participates in the trafficking of chemicals listed in Table 1, then it is almost certain that he/she is to some extent connected to the illicit narcotic drugs manufacture. The chemicals listed in Table 2 can be used for narcotic drug manufacture, but are also widely used in the manufacture of other products. For example, sulfuric acid can be used both in narcotic drugs manufacture and in automotive industry, for automobile battery fluids. Thus, when an individual provides sulfuric acid or participates in its trafficking, one should not jump into conclusions, without any additional investigation.

The police officers involved in activities related to locating and dismantling of clandestine labs must be well introduced to the chemical processes of synthetic drug manufacture, meaning that they must know exactly where and under what conditions certain narcotic drug can be manufactured and what kind of chemicals are needed for such manufacture. For example, *potassium permanganate*is is used for cocaine manufacture, but it is certain that the manufacture of this drug in our environment is not possible as we lack the raw material –coca leaves do not grow in our country. On the other hand, *acetic anhyidride* is used for heroine manufacture, which is not manufactured in our conditions, but is also used in amphetamine drugs manufacture, which is widely manufactured both in our country and in the surrounding countries.[68]

In practice, the most common ways of chemicals trafficking used for narcotic drug manufacture are as follows:[69]

- drug dealers extract some chemical substances, especially pseudoephedrine from pharmaceutical products;
- chemical substances are redirected from domestic chemical production in order to develop illicit drug manufacture within the country;
- chemical substances are legally imported into drug manufacturing countries with licit import permits and then misused;

[68] More at: *Drugs and Intoxicates*, The Security Institute Manual, Belgrade, 2005. pages 26-27.

[69] UNODC, *Precursor Control at a Glance*, Regional Precursor Control Project for SAARC countries (RAS/938), 2006, page 4., available at: http://www.unodc.org/documents/southasia/reports/Precusor_Control_at_a_Glance.pdf. 22. 02. 2018.

- chemical substances are produced in a specific country or legally imported in it, then taken out from the domestic trade and smuggled into a neigboring country with illicit drugs manufacture;
- chemical substances are mislabeled or re-packed and sold as licit substances;
- chemical substances are shipped into countries and regions which do not have a developed drug surveillance system;
- new "designer drugs" are designed with the same physical and mental effects analogue to heroin, cocaine, amphetamine, but can be manufactured from substances which are not controlled;
- drug dealers manufacture chemical substances which are controlled from substances that are not controlled, which is a very expensive and difficult chemical process;

The above listed manners of misuse of chemical substances for narcotic drug manufacture are well hidden behind false invoicing, multiple reloading, using free-trade zones and many other methods designed to conceal the true nature of the product, its final destination and purpose (Otasevic, Golubovic, 2009:176). More cautious illicit drug manufacturers often take off labels from chemical substances and burn the outer packages, preventing police attention and hampering their detection. That is why the police must pay special attention to chemicals without product name label or lacking original labels or having names or labels, but in a different and unusual language for that particular area, also lacking labels in English. In order to conceal the true nature of chemicals from the police and customs border officials, supervision officials and other services authorized for detection and control of substances used for illicit manufacture of synthetic drugs, smugglers often mix them with other substances which makes them potentially explosive, flammable and higly toxic to human life and health.

ENTRY INTO CLANDESTINE LABORATORY FOR SYNTHETIC DRUGS MANUFACTURE AND EVIDENCE COLLECTING

The ways of receiving information on the existence of a clandestine lab for synthetic drug manufacture depends on a specific act of commission. In former police work in the Republic of Serbia, all clandestine labs were discovered through the criminal police operational work. However, substantial important information can be provided by police officers in uniforms, citizens who, by the nature of their work, are in contact with different categories of people (for example, staff at coffee shops, night bars, restaurants, hotels, taxi drivers, gas station workers, car washes employees, staff at parking places, night guards, private security members, building superintendents, etc.), then drug abusers, informers, arrested persons, undercover agents, etc. Sources of information can also be seized drugs, while many modern international police forces are familiar with the practice of buying important information.

The most common indicator for the presence of clandestine labs in a specific area is the intense odour of chemicals used for drugs manufacture. Some odours resemble vinegar acid, gas, solvent, acetone, iodine, ammonia, alcohol and many other substances used for drugs manufacture. Usually, these chemicals cause nose, eyes and throat irritation. Besides the odour, indicators that can point out the presence of clandestine labs in a specific area is the huge and uneven power consumption in a specific period of time, supply of lab dishes and chemicals used for manufacture, presence of individuals with

background in chemical technology, pharmaceutical or medical industry in certain premises where one should not expect to encounter them. Important indicators may also include discarded empty tablet packages, certain amounts of discarded tablets in the close vicinity of the lab, large amounts of coffee filters with traces of white powder on it, gas bottles used as an energy source, lithium battery packages, red phosphorus dust, protective gloves, etc.

A clear indicator of clandestine labs is the equipment for drugs manufacture, such as: tablet press machine, logo or lines punch machine, moldings, brushes, lubrication pumps, tool kits for settings and maintenance, granulators, precision scales, professional powder mixers, tablet counting machine, air compressor with air blow gun and other professional equipment. In addition, there is other professional equipment available at pharmacies and general stores (for example, glassware dishes, buckets, plastic storage containers, bottles, jars, tubes, aluminum foil and other miscellaneous equipment).

When the police receive information on the existence of a clandestine lab, it is necessary to take steps in order to locate and dismantle the lab in order to disable further drugs manufacture, remediate the site from toxic, poisonous and flammable substances and locate and arrest individuals involved in the illicit manufacture. The perfect timing for force entry into a lab and termination of the lab work would be if all the suspects were present at the time of the entry and presumably involved in the actual drug manufacture. Force entry into an empty lab, vacant of persons, or when there is no actual drug manufacture, may, in some cases be counterproductive, as it might be difficult to prove what was manufactured in the lab. Forced entry must be swift and efficient. In big labs, police should enter all the facilities simultaneously, take immediate physical control over the premises and the large pieces equipment in order to prevent any possible resistance of the persons caught on site.

If a lab was operational at the time of entry, manufacture should be suspended by halting all the ongoing chemical procedures. That is why all the persons caught while the lab is operational must remain in the same positions and be put under strict control of the police officers, as they can provide necessary information on turning off the machines and halting the processes, as it also concerns their own safety.

Site Procedure

Upon taking control over the individuals and the actual physical space of the illicit manufacture clandestine lab, the police should perform complete examination of the individuals, without moving things, designate and visibly mark the space which, in a criminal sense, should be considered as a site. Unauthorized personnel should be restricted from entering the isolated area in order to prevent moving, damaging or destroying objects and traces of the crime act and take measures and actions for locating, securing and permanently securing the material evidence. It is important to secure all the changes made during the entry into the lab, i.e. permanently secure all the changes until site investigators arrive.[70]

During the procedure of dismantling the clandestine lab, the site is a unique combination of a crime scene and possible dangerous incidents related to actual hazardous substances. Thus, attention should be paid to both factors and balance them properly

[70] More at: Simonovic, B.: (2012). *The Criminalistics*, Faculty of Law, Univerity of Kragujevac and The Institute for Legal and Social Science, Kragujevac, pages 299–304.

during the action. The most important is to protect the structure of the crime scene, preventing the contamination of the evidence which is significant for the criminal proceedings. Entering and moving inside the controlled area should be the least possible and walking in and out should be allowed to authorized personnel only, specially equipped and professionally trained. Every lab entry must be registered. Media crews access should be denied and the sightseeing of the site should be absolutely forbidden (Donnell, 2004:37). All the changes which occur at the scene should be recorded in an official report, videotaped and photographed.

The other issue for consideration is that the clandestine lab site can be a very risky place, as it contains many hazardous and flammable chemicals. This is the reason why the police officers who are not trained for discovering and dismantling clandestine labs and fail to wear personal protective equipment should not enter the area of the suspected clandestine lab. Miscellaneous vapors can cause damage of the eyes, skin and the nervous and respiratory system, while some chemicals react with the air or other chemicals and can cause fires or explosions (Otasevic, Golubovic, 2009:185).

Hence, on entering the lab, proper air flow should be secured in order to diminish the risk of possible explosion. On the site, if not necessary, one should not touch any closed boxes, containers, food and beverage, as it might be chemically contaminated, nor turn on power supply, in order to prevent any possible explosions.

In order to avoid any possible consequences during clandestine lab dismantling (extreme toxic and cancerogenous vapors which, if inhaled, can cause poisoning and carcinoma), police officers should not remain long in the lab, touch or examine the equipment and substances found in the lab, smell objects and chemicals, flip switches, use equipment found on site, smoke, eat or drink on site, use flash light camera or any kind of flash light or use radio communication inside the building.

In order to diminish the detrimental consequences, after entering the lab, all sources for heating the equipment and apparatus should be turned off. However, it must not be done by disconnecting the power supply at the entire facility. On the opposite, if the cooling equipment is turned on, it should be left turned on. Cooling is done by water going through the cooling pipes. The rule is that water taps should not be closed, if they are open, until their function is determined.

Depending on each concrete situation, it is necessary to identify and verify the persons caught on site, then perform a detailed search of the premises and individuals, as well as search the apartments and other premises used as residence of those individuals. All the individuals caught on site should be detained at the police and police should conduct a full interview related to the circumstances of the manufacture and illegal trafficking of the seized drugs. This interview should provide info on the manufacture organizer, the lab owner, the type of manufactured drugs, the supply channels for the precursor substances and chemicals, whom they were delivered to, what were the distribution ways and the selling price.

In the static phase of the investigation, the site remains intact, just being monitored, reported with description of facts (factual findings), analyzed, photographed, all the evidence, objects and other relevant circumstances in the intact state are measured and sketched (Simonovic, 2012:304). On performing the aforementioned actions, one should take care not to contaminate the existing evidence on site, leaving false evidence instead.

In the dynamic phase of the investigation, the site can be altered: the objects and evidence are allowed to be moved, inspected and analyzed in detail, latent evidence can be captured, surface prints can be lifted, items and clues are allowed to be packed, while various analyses are performed.

In the dynamic phase of the investigation, evidence from the site is collected – drug samples, chemicals, waste and packaging material, samples from water connections, soil, disposal, empty containers, used equipment and clothes from the suspects. The samples should be representative (to represent accurately the larger entity) and should be taken in a sufficient quantity. Good practice includes taking two same samples and making two identical series of samples. Thus, the quantity of samples should be sufficient for the expert witness and enable the defendants to propose a trustworthy lab to re-analyze the samples, should they have any doubts in the results presented by the public prosecutor.

Besides the captured drugs and chemicals, it is necessary to confiscate the complete recovered file records, notes, notebooks, phone books, faxes, manufacture recipes, chemistry manuals, receipts, chemicals and lab equipment order forms, computers, video tapes, etc., having in mind the fact that the traces of papillary lines can also be recovered there (Otasevic, 2009:53). Papillary lines prints can be taken from all the parts of the equipment. It would be good if taking prints is recorded on video, in order to prove much easier which individual was operating which machine and also to facilitate taking a court deposition.

Any evidence collected on site must be labeled with an appropriate number tag. Documentation is the key element in securing the integrity of material evidence, as the majority of evidence (traces and items) should be immediately collected and isolated from the site, due to the danger from and for them. Documentation includes drafting quality investigation records, with an attached sketch from the site, photo documentation and audio/video recording. Lab equipment and apparatus should be photographed before dismantling, and audio/video recording of the site should not be commented and interpreted by the person who is performing the actual recording, by giving his/her personal observations. Thus, a subjective stand will be avoided and any form of suggestions and insinuation prevented during the presentation before the court.

CONCLUSION

Police officers involved in activities related to discovering and dismantling clandestine labs must have a high level of professional expertise and special competences and skills, especially in the field of pharmacy and chemistry. Namely, it is a sheer fact that the police officers are not able to recognize indicators which point out the presence of clandestine labs, i.e. chemicals that might be used in a drug manufacture, if they fail to complete proper specialist training. When it comes to clandestine labs for drug manufacture, the actual site can be a very risky place, as it contains various chemicals which are often cancerogenous, poisonous and flammable, which only indicates that police officers without appropriate training for discovering clandestine labs and proper personal protection equipment should, by no means, enter the site which is suspected to be a clandestine lab.

In the procedure of discovering clandestine labs, there is a special significance of the material evidence (traces and items) collected on site. During the investigation, evidence from the site is collected – drug samples, chemicals, waste, samples from water connections, soil, used equipment, clothes from the suspects and other items found on site.

Besides the captured drugs and chemicals, it is necessary to confiscate the complete recovered file records, notes, phone books, faxes, manufacture recipes, chemistry manuals, receipts, chemicals and lab equipment order forms, computers, video tapes, etc, having in mind the fact that traces of papillary lines can also be recovered, as well as any other item which may be used as evidence in a criminal proceeding.

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SPECIFICS OF FIRST MEASURES IN THE PLACE OF TRAFFIC ACCIDENTS IN ROAD TRAFFIC

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Abstract

Contemporary civilization flows encourage the development of various shapes and mobility, and here is also the traffic, which is aimed to the transport of persons and goods. As with many other social phenomena, the development of traffic, with extraordinary and multiple positive effects, is accompanied by numerous risks and obvious negative consequences. In addition to those manifested through environmental degradation by intensifying, land, water, and air traffic, the particular attention of citizens and the community has always attracted traffic accidents. This is particularly in case of an accident resulting in injury and death with the suffering of their participants.

When it comes to road traffic, the starting point of each research is related to defining elements that allow the event to be characterized as a traffic accident. In the Republic of Serbia, the legislator did this by determining whether it was an accident that occurred on the road or was started on the road, involving at least one vehicle on the move and in which at least one person was killed or injured or material damage was made. According to the World Health Organization (2015), according to information from 180 countries, the total number of deaths in road traffic in the world has risen to 1.25 million per year, with the highest mortality rate in low-income countries. Considering the direct and indirect material costs of traffic accidents in the European Union, the costs are estimated at around 160 billion euros per year.

A responsible approach aimed at reducing the risks that accompany the development of each and even land transport necessarily involves fast and adequate response to traffic accidents, providing assistance to injured participants, preventing the emergence of new accidents and other accidents, treatment of fatalities, as well as professional criminality technical processing of the current state of affairs aimed at identifying facts and creating as good as possible preconditions for determining the responsibility of those contributing to the occurrence of the accident.

The circumstance that additionally burdens the officials who are the actors of the first measures at the scene of a traffic accident, the topmost security of the place of events and the conduct of the investigation, arises from the fact that the area in which the area is treated is intended for public transport. As a result, with negative effects on the direct participants, traffic accidents and handling at the place of their occurrence, they can also cause disturbance of traffic conditions on the surrounding roads. This is with all the risks and harmful consequences that accompany the development of traffic in such conditions.

Taking into account the peculiarities of traffic accidents in road traffic and reliance on the results of the research, we will try to present the characteristic of the handling of traffic accidents within the scope of the first intervention measures.

Key words: *traffic accident, the first intervention measures, security of the event site, investigation*

1. INTRODUCTION

Road traffic, which is often said to be one of the indicators of development of the society, managed to secure a leading position when it comes to transport of goods and passengers. When we speak about passengers transport, as a comparative advantage, we can point out that the vehicles allow passengers an independent movement and choice times, transport "door to door", flexibility in choosing the route, customization for requirements of the users (time, place of departure, route, speed of movement, etc.), it is easy to combine with other forms of transport – it is suitable for emergency and no scheduled transport, best to fulfill demands of individual transportation, etc. [3]. On the other hand, it is often noticed and emphasizes that the development of traffic is accompanied by numerous negative effects. The most common ones are the following: endangering people and the environment in cases of transport of dangerous goods, pollution of the environment (especially air), noise, frequent provoking conflicts and disturbing interpersonal relations. Especially negative accompanying effects of traffic development are also highlighted by the fact that traffic accidents in road traffic are significantly present in the examples of death and injury to a large number, or large material damage to individuals and society [7].

Having this in mind, it is pointed out that unlawful behavior in the field of the road traffic is quite represented and that in any area of the social life there is no such massive violation of social norms as in the case of road traffic [5]. With its increasing development, this is also due to the relatively high freedom of driving by drivers, their irresponsible behavior and driving at speeds that is not adapted to traffic conditions and weather conditions [2]. It is not uncommon to point out that road traffic accidents in road traffic are the main problem of public health and the leading cause of death, injury and disability around the world. According to the World Health Organization, the number of deaths in the road traffic had increased to 1.25 million in 2013, with the highest mortality rate in countries with low or medium income. Almost half of all deaths on world roads are among motorcyclists (23%), pedestrians (22%) and bikers (4%). The above varies across regions, with the largest region in Africa and the largest share in pedestrian and cycling deaths, while in the countries of the European Union the highest mortality rate is among car drivers [8].

In order to encourage the responsible behavior of participants in traffic, and consequently to reduce the number and reduce the harmful consequences of a traffic accident, in the Republic of Serbia measures are taken on the normative plan also. Among other things, the Law on Traffic Safety (from now on - LTS) [9] in Article 167, stipulates that a person who seizes themselves or finds themselves at the scene of a traffic accident is obliged to immediately inform the police and / or the emergency medical service, provide assistance to the persons injured in the traffic accident and, if necessary, transport them to the nearest health facility and take over everything that is in their power to prevent the increasing of existing ones, or the emergence of new consequences. In the event of a serious traffic accident (serious damage to property, deaths, and / or injuries), the driver or

other participant in the traffic accident pursuant to the provisions of Article 168, shall immediately stop the vehicle, turn off the engine, turn on the direction indicators, put a triangle and notify the police and / or ambulance. These persons are also obliged to alert other participants in the traffic accident, as well as to provide assistance to injured persons and to remain at the scene of the accident until the end of the investigation, except in cases where an emergency medical aid is required to a person. Unless it poses a threat to traffic safety, a participant in a traffic accident is obliged to provide all traces and objects, and in that way speed up and facilitate the work of the police.

When it comes to the duties of the police, the provisions of Article 169 stipulate that the police shall immediately upon being informed of a traffic accident with injured or dead persons, notify the ambulance and come out to the scene of the accident. The health institution that is informed of the accident from any others sources or received to the treatment an injured person in the accident is obliged to immediately inform the competent authority of the Ministry of Interior. If a person injured in a traffic accident dies of their injuries or if there is a reasonable suspicion that the driver due to injury decreased mental ability to drive a motor vehicle or tram, the health institution shall be obliged to inform without delay, the competent authority of the Ministry of Interior. If an accident has resulted in minor damage, there is a possibility for the participants to make their own arrangements and complete the European report of traffic accidents.

With due respect to the different definitions of criminal events, the issues that arise as their result and the findings as crucial actions for determining and clarifying all criminal, procedural and other issues relevant to individuals incarnated in their occurrence. In this paper, with special attention, we represent the measures of the first procedure, i.e. criminal investigation of the events and security of the crime scene in general, and then the statistical data on traffic accidents (response time for traffic accident and the time-frame of a crime scene investigation) in the Republic of Serbia, in the period from 01.07.2014 - 30.06.2016.

2. SECURITY OF A CRIME SCENE OF TRAFFIC ACCIDENTS AND THE FIRST INTERVENTION MEASURES

When we define the place of a traffic accident, the legal definition must be respected. In this definition it is emphasized that there is a place where an accident occurred on the road, and as a necessary element to define it as a traffic accident, it is also noted that in a traffic accident at least one person is dead or injured, or, material damage was caused. Traffic accidents caused by interruption of the flow of traffic require an immediate response to rapidly mitigate and neutralize traffic congestion. Immediately after receiving the notification that a traffic accident occurred, a patrol carrying out a patrol activity will go to the accident site, it will professionally determine the factual situation, especially regarding the security of the site and the consequences of the accident, and takes responsibility for securing the site of the event until a full normalization of traffic [1] (88). According to the mentioned, at the scene of a traffic accident, the police patrol which received the notification of a traffic accident will be responsible for traffic regulation, security of the participants, and witnesses of a traffic accident before the start of the investigation, securing the vehicles that participated in a traffic accident, and providing assistance to the investigation team.

The findings of the police about a traffic accident may come from various sources, as indirect (eyewitnesses, or persons who have come to the scene of a traffic

accident or healthcare facility which has taken care of injured persons) as well as direct. In practice, the most common way of finding out about the accidents is by the direct participants.

Recognizing the importance of establishing a number of facts and circumstances that are related to traffic accidents in general, and especially for accidents with injured or killed persons, as well as those in which there was this big material damage, the legislator in Article 170 of LTS predicted the duty of the person who is authorized by law to come out to a scene of such accidents and draw up the relevant documentation on in inspection report, site sketch, situation plan, photo documentation, and other attachments).

In Article 171 LTS provides that a police officer is obliged to come to an event site of a traffic accidents that resulted in minor damage, if that is required by one of the participants in a traffic accident or a person who has suffered material damage in the accident and carry out investigation if that is required. In the event that in the above mentioned situations, immediately after the accident, if one of the participants in a traffic accident requests for the conducting of the investigation, the other participants are obliged to remain on the site of an accident until the end of the investigation (Article 171 paragraph 1 and 2 of the LTS).

As to the actions of the police officers at the scene of a traffic accident regarding the provision of security of event site and its investigation, in the Republic of Serbia they are precisely determined by the mandatory instruction from the Ministry of Internal Affairs [6].

The patrol that comes to the scene collects basic information about the accident (from the accident participants and witnesses and on the basis of direct insight), urgently reporting to the duty service and removes all persons from the trace zone. After expert assessment of the specific situation (location of accident, the consequences of accidents, traffic intensity, the speed of the approaching vehicle, etc.), and bearing in mind the degree of danger of new accidents (transparency, visibility, traffic density, speed of the passing vehicles, the situation of the victims, vehicles, motorcycles and traces of the traffic surfaces, the shortcomings of roads and transport equipment, other circumstances such as slippery roads, etc.) the patrol leader decides on the method of securing the scene and the traffic flow in the area of the accident. In accordance with the situation, the tactics and the means for security of the scene can be modified in order to increase the safety and flow ability of all or some of the vehicles. [4] (p.38). This will be done in such a way that, taking into account the peculiarities of the specific situations and to definitions of priorities: remove vehicles and objects from a part of the pavement (e.g., with one or more traffic lanes) and to organize alternating leaks; organize the flow of traffic with appropriate surfaces which meet the load requirements (e.g. berm, concrete and asphalt surfaces of sufficient width and load capacity, meadow, etc.); redirect traffic to surrounding roads; remove vehicles and items from the carriageway and immediately normalize the traffic (in case of accidents with less material damage or when the traffic safety is directly affected) or stop traffic in one or both directions. It should be noted that in practice the cases can vary a lot, so the traffic regulation can also be organized in different ways. Often, these tree basic ways of regulating traffic will be combinied: some vehicles will stop (e.g., trucks), some will be forwarded (e.g., motor vehicles), and let them alternately miss (e.g., buses), etc. [4] (p.37).

Realizing a series of specific tasks, not only of those of the team that secure a scene of a traffic accident, but also those of the team that will carry out the investigation includes: slowing down, stopping, or redirecting incoming traffic (by placing an official or

other vehicle in the appropriate positions, with respective light signals on); indicating to road traffic participants to danger on the road (the prescribed signs, using personal means and police vehicles); ordering behavior which will allow a safe departure from the traffic regime; determining the position and setting up the equipment for the professional security of the accident site (coupes, teleflash, barriers, temporary traffic signs, etc.) until the arrival of an investigation team; organizing assistance to injured persons; taking measures to prevent possible fire; taking necessary measures to prevent theft of cargo from vehicles, parts of vehicles and other property of the participants in the accident.

A Police vehicle (with rotating lights turned on) is placed on a road, along the pavement edge, directly behind the first traces and objects of an accident case, frontally facing the traces of an accident. This vehicle should be clearly visible from a distance as much as possible, so that the drivers are clearly indicated to the danger on the road and the police presence. On the other hand, police vehicle represents a solid barrier that provides additional scene security and the smooth operation of the investigating team. However, it should not be allowed that a police vehicle is the only means of securing the site. In fact, behind this vehicle, adequate warning signs and light barriers (triangle, traffic signs, barriers and other equipment available to secure the scene) must be set up in accordance with the traffic situation. This reduces the risk of hitting the police vehicle and ensures the event site. The specific positions of specific means for securing the site should be determined in accordance with the given recommendations, bearing in mind available resources, their technical characteristics, manufacturer's recommendations and specific road conditions [4] (p.44).

As in cases of other events, when securing a traffic accident, it is possible to distinguish the internal and external zone of the security of the accident site. The inner zone (blockade) includes the narrowest area where there are traces and objects of a traffic accident. Entry into this zone is allowed very selectively (only for officers with a precisely defined task). The outer zone (blockade) is a wider space that serves as a security zone and should enable safe and unobstructed crime scene investigation. In the area of external blockade, there may be members of an investigation team that does not handle clues, participants, and witnesses of an accident, etc., and in a part that is not oriented towards traffic (preferably next to the roadway). The patrol that provides the event site security will carefully determine the outer border of the external blockade, depending on the specific conditions (terrain configuration, traffic, transparency, visibility, etc.) [4] (p.43).

Respecting the chronology of events and activities from obtaining the initial information until the completion of all activities related to specific traffic accident, the police officer will enter significant information into the report regarding security of the traffic accidents. In addition to the operational significance (analysis of efficiency of the police work, identification of possible omissions in the work of certain services, etc.) this report can have a procedural character. Namely, a copy of the report will be attached to the investigation documentation which provides certain information relevant to the subsequent analysis of the traffic accident [4] (p.44).

Of importance for understanding of the specificity of treatment during criminal investigations of the site of a traffic accidents, as well as provision of Article 174 of the LTS, among other things, it was emphasized that the person involved in a traffic accident should not take alcoholic drinks and / or psychoactive substances until the investigation is carried out, and that the authorized person who performs a traffic accident investigation in which there are dead or injured persons, is obligated to take blood or blood and urine of direct participants in traffic accidents, in order to determine the amount of alcohol in the

blood, or the presence of psychoactive substances in the body. During the conducting of a traffic accident investigation in which there are no dead or injured persons, the police officer is obligated to test drivers who were participants in the accident by appropriate means (alcoholmeter, drug test, etc.). Alco-testing of participants is done publicly, and the process and results of alcohol testing should be made visible to other participants in the traffic accident, or eyewitnesses. [4] (p.49).

3. DETECTION OF ACCIDENTS, RESPONSE TIME AND TIME-FRAME OF CRIME SCENE INVESTIGATION

The fact is that the handling of traffic accidents, since they happen on the traffic surfaces, under very different conditions that entail a variety of consequences, accompanied by numerous new risks, requires an adequate professional response from all the subjects involved in them. Among the assumptions of such an answer, we can be separate the response time on the information that a traffic accident has occurred.

During the analysis of the situation in the Republic of Serbia and regarding the response time to the occurrence of a traffic accident and length of the investigation, we analyzed the data on traffic accidents with fatal consequences, injured persons, and material damage, which are processed by police officers of the Ministry of Internal Affairs in the period 01.07.2014. - 06/30/2016.

In the total number of 69613 traffic accidents, 1060 accidents with life-related deaths were recorded (273 in the second half of 2014, 548 in 2015 and 236 in the first half of 2016), 26367 accidents with injuries (6969 in the second half of 2014 13107 in 2015 and 6300 in the first half of 2016) and 42177 those with material damage (11357 in the second half of 2014, 20517 in 2015 and 10303 in the first half of 2016). By analyzing the time frame that has passed from the moment of the accident occur to finding out about it, it has been found that in 69092 (99.25%) cases, the police officers arrived in less than 24 hours.[71] For one traffic accident with a fatal outcome, it was heard over after 53 hours. The time period of more than 24 hours from a traffic accident with the injured person (persons) to the knowledge of it by police officers was passed in 349 cases. The same was noted in 150 traffic accidents that had resulted in only material damage.

Given the extremely high proportion of traffic accidents in which police officers were aware of their occurrence within a time frame of less than 24 hours, further analysis is pointed to the 1059 traffic accidents with fatal consequences, 26022 accidents with injured persons, and 42011 of those resulted in only material damage.

The average time elapsed since the accident to the knowledge of it in the observed period was 00:33:32, while the average time from the knowledge of the accident, to the beginning of the investigation is 00:22:56. The average duration of the investigation is 01:05:18.

When it comes to traffic accidents with fatal consequences, the average time from the accident to the knowledge of it is 00:19:32, while the average time from the

[71] In one case, when entering information about the manner in which a traffic accident occurred, the mistakes are made by the police officer, which prevented further analysis. This is because in some information about the traffic accident or about going to the event site, it is registered so that, contrary to the logic of things, it chronologically precedes the event itself, or the information about it.

knowledge of the accident to the beginning of the investigation is almost 00:28:54. The average duration of the investigation is 02:15:12.

When it comes to traffic accidents with injured persons, the average time from the accident to the knowledge of it is 00:29:56; while the average time passed from the knowledge of the accident to the beginning of the investigation is 00:20:21. The average duration of the investigation is 01:17:33.

When it comes to traffic accidents with material damage, the average time from the accident to the knowledge of it in the observed period is 00:36:08, while the average time from the knowledge of the accident to the beginning of the investigation is 00:24:23. The average duration of the investigation is 00:51:37.

From the above, it can be seen that police officers in the shortest time knew about the traffic accident with consequences with dead persons, and that the longest time was related to traffic accidents which resulted in only material damage. When it comes to the flow of time from knowledge of traffic accidents to the beginning of the investigation, it is the longest in the cases of traffic accidents with dead persons, and the average duration of the investigation regarding these accidents is the longest. Significantly less is when it comes to traffic accidents with injured persons and the shortest is in the case of traffic accidents which had resulted in only material damage. The fact that the investigation of traffic accidents with dead persons lasts longer requires no special clarification. This, above all, is primarily due to a legal qualification of the traffic accidents, the fatal consequences, the multitude and significance of the clues that accompany them. The explanation for a longer flow of time from the time of the traffic accident to the beginning of the investigation in these accidents is related to the fact that as the head of the investigation, the competent prosecutor appears, who is not always able to come immediately to the place of the accident after receiving the notification (it is often waited for police officers to come and took him to the place of traffic accidents).

By analyzing the existing data of the Ministry of Internal Affairs of the Republic of Serbia, very significant differences have also been found in the response time of the investigation authority that deal with the area of certain police departments. Among the reasons for this situation are those that can be linked to a different organization of conducting a traffic accident investigation. In addition to this, at the time of the knowledge of a traffic accident, as well as the time it takes patrols of the traffic police to arrive at the scene of a traffic accident, other factors may be affected. These factors primarily include: the inability of participants in a traffic accident to explain where they are and what the problem is; inaccurate demographic information (address is incorrect); insufficient staffing, as well as the lack of equipment, material and technical means; traffic police patrol is diverted to the site of a traffic accident where there is a severe impact or is a traffic accident on the high priority road; traffic jams; bad weather conditions. In order to improve the time of knowledge, as well as the response time of traffic police patrol, it is essential for participants in a traffic accident to give details of the address where the traffic accident occurred, as well as information about the nature of the traffic accident.

4. CONCLUSION

Starting from the fact that traffic accidents are an inevitable companion of modern man's life, we tried to point out the importance of the actions that were taken by the traffic police on the place where they happened, either alone, as well as professionals engaged by public prosecutors as leaders of pre-trial process. This points out to the importance of timely data acquisition on traffic accidents and then emphasizes the necessity for the most urgent departure to the site of the accident and the application of adequate methods of preservation of the situation at the scene of a traffic accident. The numerous, varied, often and very serious consequences of traffic accidents by their participants, as well as other entities (individuals and legal entities) require maximum dedication of all officials whose professional commitment, among other things, provides a preliminary, and often crucial material for decision making in procedures that may be instituted on the occasion of a specific accident (criminal, for compensation of damages, confiscation of driver's license).

The specialization of police officers and the other organization that will ensure the professional approach for securing the traffic accident scene, and also the shortest possible time after getting information about a traffic accident occur, are also necessary due to the complexity of the situation dictated by the fact that accidents occur on the roads, and then by engaging the investigation and other present teams (emergency teams, firefighters, power utilities, water supply and other utility services). In addition to this, equipping the police with modern equipment for monitoring and controlling traffic from the control center will enable police to be present at the scene of a traffic accident in a very short time.

The presumption of treatment that will reduce possible damage and risks (e.g. from the occurrence of new accidents) is also a quick and high quality assessment of the specific situation (location of the accident, road conditions, visibility, traffic intensity, speed of vehicles, positions of the injured, vehicles, clues on traffic surfaces, traffic equipment), notification of relevant institutions and defining the priority of handling at the site of the accident (organizing of assistance to injured persons, for positioning and setting up equipment for professional security of the site of traffic accident, suspension of traffic in one or both directions, removal of vehicles and objects from the part of the roadway of the organization of alternate leakage of vehicles, organization of traffic flows to the appropriate areas by the road, reorientation of traffic to the surrounding roads, etc.).

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INTERNATIONAL COOPERATION IN DISCOVERING, DETERMINING AND SECURING EVIDENCE OF COMPUTER CRIMINALITY IN THE REPUBLIC OF MACEDONIA

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Abstract

Computer crime as a contemporary form of criminality does not know the boundaries, for a short period of time, or for a fraction of a second of criminal activity, the consequence arises according to the intent of the perpetrator, and the range can be completely at the other end of the world. It is a crime that has a number of ways of execution, a large number of victims, the motives are different from satisfying sex passions, misuse of personal data, appropriation of foreign funds to causing major disasters such as computer diversions and computer terrorism. What is common to all forms of computer criminality is the means of committing or the object of a criminal attack as significant criminalistic characteristics. And this suggests that the evidence for clarifying this criminality is electronic and related in the very way, the means and object of a criminal attack. In order to provide relevant evidence and to clarify the criminal way of acting and the involvement of perpetrators in a criminal operation, international cooperation is necessary to provide evidence of the criminal network of perpetrators, their criminal activities, the way of distribution of criminal proceeds, but also to arrest the perpetrators and thus enable the uninterrupted initiation of criminal proceedings on the basis of the relevant evidence. The subject of the paper is an analysis of the preconditions for establishing international cooperation of the Republic of Macedonia in the process of detection, clarification and proving of computer crime and analysis of cases of such cooperation in the period 2010-2016.

Key words: computer crime, electronic evidence, criminal networking, case analysis and international cooperation

1. INTRODUCTION

Computer crime is a general formulation that includes various forms among which are the forms of criminal behavior. Namely, it is a crime that is directed against the security of the computer systems as a whole or in its individual part in different ways and with different means with the intention of gaining some benefit for one's self or for other persons to be inflicted upon some damage. (Jovashevik: 2002)

In the recent years, computer crime has earned a serious approach by the international community that sees the consequences for the security of the industry, the financial system, and in general, global security and economy in the world. Numerous possibilities exist for the abuses of information systems and computer networks, and it is known that without a computer system, no security service can function in the modern conditions of communication, cooperation, and exchange of data, and the same applies to all spheres of socioeconomic, legal, and social system of functioning of a society, but also the world as a whole, which gradually becomes a global communication village.

Computer crime, given the convenience that information global network provides, is a crime that does not need to physically cross the border from one state to another; it is not necessary to commit criminal behavior to the same place where the consequence arises. The specificity of this crime is that criminals from one country may commit crimes with the help of a computer as a means of execution, and the consequences arise in other two or more countries. As a condition for the existence of elements of internationality is that the crime is carried out in the territory of at least two states, the consequence of being on the territory of another state, the perpetrators to take criminal activities from several states in a criminal operation. It is particularly specific for the criminal investigation of organized criminal groups organized with electronic communication. They form special forums (groups) where the approach is limited and with the recommendation of an already experienced member of the criminal group. The criminal purpose is the acquisition of financial means by using schemes, methods and techniques created by members, and part of the criminal activities. It is specific that each of the criminal groups is perceived according to the realized criminal yield. These criminal operations are complex, the criminalistic research on illumination and the provision of evidence is a complex process requiring legal procedures and established principles of cooperation between the competent institutions of the system of each country individually and coordinated in the international investigations. International cooperation is established on the incentive of one or more state bodies, most often police, and cooperation can be directly between two neighboring states based on bilateral agreements. Co-operation can be regional (referring to several countries in one region in order to work jointly in the suppression of several types of crime, including computer crime with a regional character).

The Convention on Computer Crime was adopted on November 11, 2001, and signed the same year in Budapest on November 23, 2001, and the Republic of Macedonia adopted the Law on Ratification of the Convention on Computer Crime, which came into force on July 2, 2004.[72]

The Republic of Macedonia is a signatory of the Declaration on Combating Cybercrime, which was signed on 31.10.2008 at the inter-ministerial conference of the countries of Southeast Europe, held in Moldova. The Ministers of Internal Affairs and justice of the countries of Southeast Europe (SEE) have departed from the jointly established fact about the danger of the proliferation of cybercrime, as well as the cross-border aspect of this negative phenomenon, whose damages and consequences are a serious threat to the banking systems and the overall economic security of the countries of the region. Computer crime may also have a wider scale of countries, given that with the help of information technology criminal offences can also be large scale in terms of the area of criminal activity. In such cases it is handled according to the international

[72] Law on Ratification of the Convention on Computer Crime, no. 07-2623 / 1, 16 June 2004, Republic of Macedonia, Skopje.

documents and in coordination with the international bodies, which are INTERPOL, EUROPOL, SELEC National Office, etc.

The study of the international cooperation that the Republic of Macedonia has in relation to the criminal investigation of computer crime has been caused by several current problems that have a criminal character and from the knowledge that perpetrators from our country are involved in crime groups of organized character. Macedonian police in the past years has strengthened the organizational and expert capacities in order to adequately react and cooperate with colleagues from other countries. The successful accomplishment of the anticipated tasks is also reflected in the achieved results in the implementation of international investigations for the detection and provision of evidence, and as more specific the case is “DARKOD" for which a case analysis was undertaken, as well as other more specific cases.

2. CRIMINALISTIC FEATURES OF COMPUTER CRIMINALITY

The advantages of information systems and computer networks in the overall social life do not remain unused by organized groups and individuals who use the knowledge in the field of informatics for illegal criminal purposes regardless of whether they realize illegal property gain or in any other way violate the rights and freedom of citizens, endangering the property of the citizens, but also the overall security that includes the protection of the national, racial, religious, social and economic rights of citizens regardless of where they are on the globe. Criminals in the world do not choose funds for criminal activity. The computer is the perfect means for achieving certain criminal goals with little possibility for their detection, because the cause is at one point of the globe, and the consequences can be in many places at completely different ends of the world; even the participants in the criminal network are not familiar to each other, but they are linked by their knowledge, power and skills in computer technology, but also in the criminal target. The computer becomes more and more a means of performing various forms of illicit, illegal, and socially dangerous activities. Computer criminality becomes synonymous with all kinds of criminal behaviors and plays an important role in the criminal behavior, whether it is computer abuse as a means of committing criminal activity or as an object of a criminal attack.

An important criminalistic feature of computer criminality is that the perpetrator acts from one point of the Planet Earth, and the consequence or consequences occur somewhere far, at the other end of the world (Radius operandi). The perpetrator and the victim do not know each other personally and the perpetrators who build criminal networks across several countries of the world are associated with the demand for the realization of high-profile criminal goals and small opportunities for detecting their crime. This often fails because criminal behavior in some countries of the world is not criminalized or there are inappropriate incriminations. The perpetrator of cybercrime is special, sophisticated, penetrating, technically under-covered, uncircumcised, obsessed, sometimes sanctified by an individual who is hard to resist, and more difficult to prevent in the criminal intent. The perpetrators rarely act alone, they have the gift of connection, the search for new opportunities, they form a criminal network, which in the course of time receives competitive aspirations where they will find new methods and technical possibilities for criminal activity, and the possibilities for leaving traces and evidence from their criminal actions are reduced to a minimum. But, because modern criminology does not recognize "perfect crime" or no crime without any trace or evidence, which links the perpetrator with

the specific crime, a new branch of the criminalistic methodology is being developed that improves the methods, means and knowledge in providing evidence or procedure for the acquisition of evidence and their presentation to the judicial authorities in order to sanction the perpetrators of computer crimes. But, is it always possible? Whether the goal towards which the national law is aiming is appropriate incrimination of the emerging forms of cybercrime, the acceptance of the recommendations of international documents in some way imposes the need to harmonize national legislation in order to enable the successful conduct and implementation of international actions for illumination and proving transnational cybercrime.

According to most definitions of computer criminality, it is commonly found that computer crimes are those criminal behaviors where the computer is used as an instrument of execution (instrumentum operandi) or as an object of a criminal attack. Thus, August Bequai defines cybercrime as a criminal offence in which a computer appears as a means or object of protection, that is, the use of a computer in fraud, misappropriation or abuse, the purpose of which is the appropriation of money or services or the pursuit of a political or business manipulation that includes actions targeted to the computer. (Bequai: 1978) Bogo Brvar (Brvar: 1982) has his own definition of cybercrime and that it is a crime in which a computer appears as a tool or an object for whose performance or attempt, certain knowledge of computer science or computers is necessary. Gjorgje Ignjatovic under cybercrime implies a special type of criminal behavior in which a computer system (understood as a unity of hardware and software) appears either as a means of execution or as an object of a crime, if the act in any other way or to another object could not at all be performed or have other characteristics. (Ignjatović: 1991)

As an important feature of computer criminality is the area of criminal activity. This crime knows no boundaries between countries and continents, and for this there is a special contribution to the Internet. The perpetrator can from anywhere in the world attack a computer system wherever it is located, this is enabled by the quick way of processing the data on more sophisticated computers, so that the radius operandi and the tempus operandi framework have little significance in relation to most forms of computer criminality.

From the point of view of the area of criminal activity (radius operandi), cybercrime has the characteristics of a criminal activity from one point of the globe, and in a second, the consequence is on multiple points on the globe, in particular, the computer viruses that can cause serious consequences for the computer systems and networks, and anticipated and desired by criminals harms individuals and companies. In this regard, here is the need for international cooperation in the detection, clarification and provision of evidence for committed computer crimes and for prosecuting their perpetrators, but also international cooperation in the area of financial investigation for finding, providing and facilitating the confiscation of criminal proceeds and property. By financial cybercrime, perpetrators acquire high amounts of money, especially crime associated with malpractice of payment cards and computer frauds in the electronic commerce.

3. INTERNATIONAL COOPERATION IN DISCOVERING, DETERMINING AND PROVING OF COMPUTER CRIMINALITY

3.1. Basics of international cooperation

The basis for the establishment of international cooperation in detecting, clarifying, and proving cyber crime is in the criminal operation to commit crimes on the territory of two or more states; the perpetrators act from one state, and the consequence arises on the territory of another state or in other countries. For this reason, when it comes to cybercrime and its criminalistics related to the place and the area of criminal activity, the requirement of internationality is in many cases fulfilled. This should include organized crime groups operating in the territory of two or more states (Mijalkovic, Boskovic and Marinkovic: 2011), criminal groups organized through electronic communication, electronically plan and implement criminal activities, and electronically transfer financial assets acquired by committed crimes. Precisely because of the overall criminal investigation and the provision of the relevant evidence, international cooperation is necessary. Cyber crime is under the authority of the police which means that international police cooperation should be constantly developed and national legislation harmonised a precondition for establishing cooperation. Harmonization should be aimed at incriminating the same or similar criminal acts and in the direction of procedural action in the part of undertaking measures and actions for providing relevant electronic evidence necessary for the prosecution of the perpetrators.

Computer crime will be the most widespread international crime in the future. Criminals use the latest technologies for committing financial burglary, theft of personal data, terrorism, child pornography and spread hatred. It is emphasized at numerous international meetings aimed at raising the cooperation at the national and international level to combat this crime with which not only financial damages to individuals and companies are inflicted, but also criminal offences that violate sexual freedoms and rights, aggravate personal data, but also the most difficult forms of criminal acts such as computer terrorism, and in the part of economics computer espionage and sabotage as serious dangers causing unfair competition.

Computer crime has a wide range of criminal activities that are related to direct acting: operation of an individual, but also the pursuit of criminal activities of a criminal group, with the division of criminal roles through organized, professional, and increasingly strictly specialized executors for a particular computer criminal operation. These criminal groups, on the one hand, "traditional" groups of organized crime are refined and modernized by the use of information and communication technology are especially prepared and specialized in criminal activities and are thus prepared to enter the criminal scene of the global cyber space. These criminal groups organizing criminal actions are named a computer mafia, which has its own rules, a different way of behavior than the conventional mafia, as they have a specific environment. Its activities are mainly facilitated by the specific environment and the way of criminal activity, where the environment is virtual, the weapon is information, and the knowledge is specialized. (Nikoloska: 2015)

Internationalism, transnationalism, and multidimensionality are just some of the features of the computer mafia, whose organizational formula is not so simple, common, and uniform as it is with other forms of organized crime that further confirms the image of their uniqueness.

International criminal activities can be suppressed by developing effective models of international police cooperation. Efficiency in international cooperation is conditioned by the elimination of many disadvantages in the organizational and functional sense of the national police and other security entities. (Mijalkovic, Boskovic and Marinkovic: 2011)

The framework of international police cooperation can be established at three interconnected levels (Santiago, 2000), namely:

1. Macro level which is an interstate level where important decisions are made on the basis of concluded bilateral agreements, extradition procedures, etc;

2. Intermediate level which involves deciding on procedural frameworks for police operative action by creating new ways of cooperation, using communication systems and fostering direct contacts with police officers, and including partially in operational work to the extent that it is foreseen in accordance with an inter-religious Police Cooperation Act;

3. Micro level, at which investigations are conducted for specific crimes and the prevention of special criminal forms.

The EU Forum, which includes a variety of agencies, providers, Internet services, telecommunications operators, organisations for protection of human rights, consumer representatives, data protection authorities and all other concerned in the fight against transnational cybercrime, has a significant role to play in the establishment of cooperation in the fight against cybercrime at European level. The forum should allow:

1. Development of a 24-hour interconnection of state bodies and industry;
2. Defining standard requirements by which providers should provide information for using the Internet;
3. Building and applying the Code of Ethics with defining "good business customs" for all actors, and in particular in the mutual relations between state bodies and industry;
4. Encouraging the exchange of information on high technology crime trends among the various partners, in particular within the industry;
5. Establishment of special groups for the development of new technologies, development of management of the mechanisms for protection, facilitating identification and overcoming the hazards associated with the information infrastructure;
6. Establishing solid forms of expert cooperation between different international organizations, bodies and associations (Example: Council of Europe and Group D-8) and
7. Development of principles of cooperation (Memorandum of Understanding Codes of Practice in line with the legal framework).

The international cooperation on computer crime is a complex matter conditioned by the harmonization of the national legislation with the international legal acts by accepting the recommendations for incriminating the same or similar computer crimes, as well as in the prediction of procedural measures and actions for legal actions and provision of pre-material. However, in order to fully clarify and provide evidence and enable prosecution of perpetrators, measures and actions are taken to secure the suspects, and in particular actions are undertaken for finding and arresting perpetrators and facilitating the smooth conduct of criminal proceedings.

It is recommended that international cooperation takes place through the application of relevant international instruments in criminal matters through arrangements established on the basis of uniformity or reciprocity of the domestic law or through the application of the domestic law in order to carry out an investigation or proceeding in

relation to criminal offences related to computer systems or data, or in the collection of evidence in electronic form for a particular crime. Enhanced international cooperation in terms of providing mutual assistance is recommended, and in particular recommendations for regulating procedures regarding requests for mutual assistance in the absence of an international instrument and mutual assistance regarding procedural measures. Mutual assistance in particular should be directed towards the expeditious preservation of stored computer data and expeditious detection of stored portable data. On the other hand, mutual assistance with regard to authorizations should be in relation to the access to stored computer data; cross-border access to stored computer data with prior consent or when such data is publicly available; mutual assistance in collecting real-time portable data and mutual assistance regarding interception of content data.

3.2. More important international documents

3.2.1. Convention on Cybercrime

The Convention on Cybercrime was adopted by the Council of Europe on 23 November 2001 in Budapest in order to pursue a common policy aimed at protecting the society against cybercrime, inter alia, by adopting appropriate legislation and fostering the international cooperation of the signatory countries of this document. The Republic of Macedonia adopted the Law on Ratification of the Convention on Computer Crime, which entered into force on July 2, 2004.

The need for the adoption of this Convention is triggered by the fundamental changes that have arisen with the digitization, convergence, and continuous globalization of computer networks, but also because of the risk that computer networks and electronic information can be used to commit crimes and that evidence relating to the execution of such works can be preserved and transmitted through these networks.

The contribution of the Convention should be a more effective fight against cybercrime, as well as the protection of legitimate interests in the use and development of information technologies. It is also considered that this Convention is necessary to deter from acts directed against the secrecy, integrity, and availability of computer systems and networks and computer data, as well as against the abuse of such systems, networks and data by criminalizing the activities described in this Convention by introducing the powers necessary to effectively combat such crimes by enabling them to detect, investigate, and prosecute at the national and international levels and through the provision of an arrangement for fast and reliable international cooperation. Recommendations are given for finding legal solutions regarding the actions of the competent authorities in the process of detection, clarification and proving of cybercrime.

Particular emphasis is placed on the measure "search and seizure of stored computer data" according to which the competent authorities will have the legal powers to take actions that will ensure access to a computer system, as well as the stored computer data therein and the medium for storing computer data in which computer data can be stored and located in its territory. It also provides for the seizure of computer data by means of specific authorizations which may be seized or similarly provided for a computer system or part thereof or a medium for the storage of computer data, to make or keep a copy of those computer data, to preserve the integrity of the relevant stored computer data, to make them inaccessible or to remove all computer data from the available computer systems. (Nikoloska: 2013)

The Convention on Cybercrime contains recommendations for the national legislation in the area of international cooperation in order to successfully clarify criminal cases where crime has spread to the territory of two or more states, which is a reality, given the technical and communication capabilities used by the perpetrators of these criminal behaviors in achieving their criminal purpose. The Convention is a comprehensive document outlining recommendations for the harmonization of national legislation with regard to the incrimination of computer crime groups, such as:

8. Acts against the secrecy, integrity and accessibility of computer systems and data to be incriminated, i.e. predicted as criminal offences when committed with intent; the acts of unlawful access to the whole or part of a particular computer system; the acts of unlawful interception; acts of unlawful damage, deletion, deterioration, alteration or concealment of computer data (data entry); acts of unlawful and serious obstruction of the functioning of a particular computer system for entering or hiding computer data (intrusion into a system);
9. Acts whose execution is connected with a computer, i.e. incriminating specific criminal acts, such as: computer-related forgery (insertion, alteration, deletion or concealment of computer data); computer-related fraud;
10. Acts related to child pornography –— incriminating, i.e., prediction as criminal acts with the criminal behaviour of production of child pornography for the purpose of its distribution through a computer system. The term "child pornography" means pornographic material that visually depicts an apparent sexual act with a minor, an apparent sexual act with a person who looks like a minor and realistic images showing an apparent sexual act with a minor;
11. Acts related to the violation of copyright and other related rights, where it is recommended that national laws are incriminated, i.e., to foresee criminal acts as infringements of copyrights.

The cybercrime convention foresees for the aforementioned incriminations the responsibility for the legal entities in cases when the crime was committed in their favor by a natural person, regardless of whether the person acted as an individual or as a member of a collegial body of the legal entity, while having managerial position, and on the basis of authorization for representation of the legal entity, an authority to make decisions on behalf of the legal entity or an authority to exercise control in the legal entity. It is also recommended to introduce penal responsibility of the legal entity in cases when due to non-execution of supervision or control by a natural person, some of the criminal acts stipulated by this Convention came from another authorized natural person in order to benefit from the legal entity.

Article 35 of the Computer Criminal Convention is a contact point 24/7, which requires each signatory party to determine a contact point that will be made available 24 hours during all seven days of the week in order to carry out investigative and other procedural actions in relation to criminal acts related to computer systems and data, or for the collection of evidence in electronic form for a particular crime. In the Republic of Macedonia since 2008 the duty center operates 24/7.

3.2.2 An Additional Protocol to the Convention on the Prevention of Cybercrime,

Concerning the Punishment of Acts of Racism and Xenophobia Performed through a Computer System

The annexed Protocol to the Convention on the Prevention of Cybercrime concerning the Punishment of acts of racism and xenophobia committed through a computer system was adopted in Strasbourg on January 28, 2003, in order to highlight and improve the freedoms of citizens, regardless of their nationality, faith, affiliation, etc. The Republic of Macedonia adopted a special Law on Ratification of the Additional Protocol to the Convention on Computer Crime for the Incrimination of Crimes of a Racist and Xenophobic Type through an information system that entered into force on July 13, 2005.

It emphasizes the need to ensure the full and effective application of all human rights without any discrimination or distinction as guaranteed by European and other international documents, convinced that acts of racism and xenophobic nature constitute a violation of human rights and the dangers of the rule of law and democratic stability. It is considered that national and international law should provide appropriate legal responses to the propaganda of racist and xenophobic nature carried out through computer systems, and taking into account technical and communication incentives for transmitting information across the globe for a short period of time.

This protocol defines the term "racist and xenophobic material" which is any written material, image or any other presentation of ideas or theories that help, promote, or encourage hatred, discrimination, or violence against any individual or a group of individuals based on race, skin color, hereditary, national or ethnic origin, as well as religious origin if used as an excuse for any of these factors.

3.2.3 Declaration on Combating Cybercrime

In order to better implement the recommendations of the Convention, a Declaration on the Fight against Cybercrime was signed in 2008 at the inter-ministerial conference of the countries of Southeast Europe held in Moldova. In creating this important document, the Southeast European Ministers of Interior (SEE) have embarked on a commonly established fact about the threat of the proliferation of cybercrime, as well as the cross-border aspect of this negative phenomenon, which harms and consequences are a serious threat to the banking systems and the overall economic security of the countries of the region. From that perspective, the need for establishing a clear mechanism and a network of regional cooperation for the prevention of this type of electronic crime has declared the need for building a rapidly developing and functional international cooperation by intensifying the existing potentials and resources for regional cooperation between the authorities responsible for combating cybercrime.

Practically, the joint declaration on cooperation is aimed at the full implementation of the UN Convention against Transnational Organized Crime of 15 November 2000, the Convention of the Council of Europe on Cybercrime of 23 November 2001 and the Convention for East European Police Cooperation of May 5, 2006. In that sense, with the declaration, which represents an additional bond for more efficient use of the networks of Interpol, Europol and SELEC National Office in the process of information exchange in the given area, the SEE Ministries of Interior have agreed on a multi-directional action and cooperation in the fight against cybercrime.

Starting from the appropriate harmonization of the powers and procedures provided in the Convention on Cybercrime with the national legislation for ensuring adequate protection of human rights and freedoms, we com to the normative sanctioning of the illegal acts committed by the misuse of information technology. Also, the signatory countries agree to create a favorable space for improving the legal basis for regional co-operation, including the signing of intergovernmental agreements, co-operation in combating cybercrime and police co-operation.

In the operative part of the declaration, it was agreed to establish appropriate techniques, methods and ways for combating cybercrime, with additional intensification of education, training, exchange of experience at regional level, including all bodies involved in the process of combating this type of crime, as well as through increasing the involvement of Europol, Interpol, SELEC National Office and the SEPC in the exchange of operational information. There is a particular emphasis on the exchange of information on new fraudulent information schemes and new methods for combating this phenomenon, by providing mutual assistance in real time, collecting data from the realized traffic that relates to the specific communication transmitted through the computer systems in the territory of each country individually.

Of particular importance for the field of cybercrime is the United Nations Convention against Transnational Organized Crime with additional Protocols, of Palermo 2000.[73]

The Palermo Convention is a significant advance in global determining, the definition of transnational organized crime, and the identification of changes that countries should implement in their criminal legislation, in order to effectively counter the organized crime.

The link between transnational organized crime and cybercrime is the use of modern technology in the perpetration of criminal acts, that is, the engagement of people capable of working with computers, especially money laundering, or the use of high technology to cover up traces and the money from illegal businesses (drugs, weapons smuggling, etc.) to be converted into legal businesses and used for them.

This Convention requires from the States Parties to establish national bodies that will supervise financial institutions that are vulnerable to laundering, and provide organs dealing with the fight against money laundering with the opportunity to cooperate in the exchange of information both on the national and international level.[74]

G8 - SUBGROUP FOR HIGH TECHNICAL CRIME

The G8 countries as a sub-group for high-tech crime was established in 1997 in Washington, DC, which included investigations involving electronic evidence. In computer-related investigations it is important that countries store electronic data or ask the ISP to save the data. To improve the traditional method of getting help, the G8 has created a network to speed up contacts between member states or other states, that is the 24/7 network.

[73] The text of the Convention is the final version of the work of the AD HOC Committee at the UN in Vienna since July 200. In November 2000, the text of the Convention was approved by the United Nations General Assembly in New York, and from 12-15 December 2000 in Palermo - Italy, the convention was opened for the signing and accession of more than 130 countries.

[74] http://www.osce.org/me/montenegro/117630?download=true

The Network strives to make every effort to provide the requested data as quickly as possible, to contact the ISP, and it is required by all Member States or other draws.[75] The aim is to build a global capacity to prevent criminal and terrorist abuses of high technology, as well as the Internet. For this purpose they concluded that a set of measures for the prevention of serious crimes, including the field of telecommunications, should be adopted. This includes theft and sale of data and information, and the use of viruses and other harmful programs. The G8 Summit held in St. Petersburg in 2006 was dedicated to the fight against terrorist threats, and the commitment to cooperation with the international partners was confirmed, including the effective handling of any attempt to misuse computer space for terrorist purposes, instigating terrorist acts, use for communication between terrorists, planning of terrorist acts, as well as recruitment and training of terrorists. In 2011, the group had a meeting in Deauville - France, with the included declaration included in the Internet section.[76]

4. COMPUTER FORENSICS

Computer forensics is engaged in the collection of digital evidence from the scene of a computer crime. The computer crime scene, according to Peter Stephenson's explanation, is "one computer (or more computers) that attacks another computer (or more computers) through some means." It is important that evidence material provided from the crime scene site can serve as evidence and evidence to be complete in the context of the investigated event. Each computer incident has a source, path, and victim. What needs to be answered first is whether it is a computer incident, since quite often the suspicions about a computer incident after providing evidence material is clarified that it is not an incident (a crime), but a technical error or something else." (James H. S. and Norby: 2009)

All types of computer-related incidents based on Rosenblatt (Rosenblatt: 1995), in the initial investigation and penetration into the computer network, have six objectives, with the following order of importance:

- Understand how the hacker enters the system;
- Obtain the necessary information to justify the device for wiretapping in the telephone line used by the hacker;
- To discover why the hacker has chosen the victim's computer;
- Gather as much evidence as possible of the breakthrough itself;
- Collect information that can narrow down the list of suspects or at least determine that the hacker is not an employee;
- To document the damage caused to the victim, including the time and labor that the victim spent on investigating the incident and determining the extent of the damage inflicted on the computer.

Evidence in all proceedings is essentially a crown of judgment. The purpose of the evidence procedure is to create a conviction in the truthfulness of what is charged to the defendant, i.e., the truth of the charge, which is also the object of the charge.

Computer forensics integrates areas of the Law on computer science and crime research. For digital evidence to be legally admitted to the court, investigators must follow appropriate legal procedures in recovering and analyzing data from computer systems. Unfortunately, laws written before the era of computer forensics are often outdated and

[75]http://www.oas.org/juridico/english/cyb_pry_G8_network.pdf
[76]http://www.cybercrimelaw.net/G8.html

cannot adequately assess the techniques used in searching the computer system. The inability of the law to keep abreast of technological advances can ultimately limit the use of evidence of computer forensics in court. Advocates of private protection are particularly concerned that computer searches may be a violation of the human rights of the suspect. Furthermore, as methods of encryption and anonymity become more advanced, technology can be abused, helping criminals to hide their actions. In the end, the role of technology in computer forensics may not reach its full potential due to legal boundaries and potential malicious intentions.[77]

4.1. Digital Evidence

According to the international definition in the field of forensic sciences, digital proof is any information in a digital form that has a probative value and which is adapted or transmitted in such a form. The term digital proof includes computer stored or generated evidence information, digitized audio and video evidence signals, digital cell phone signals, information on digital fax machines and signals from other digital devices. So, digital proof is any information generated, processed, stored, or transmitted in a digital form that the court can accept as the relevant, that is, any information composed of the digits 1 and 0, stored or transmitted in digital form, and other possible copies of original digital information that has probative value and on which the court can rely in the context of forensic acquisition, analysis and presentation. When taken into account written and audio proofs or photographs, the court sometimes requires the original evidence. This requirement is necessary to prevent witnesses from misinterpreting certain materials, so that they would lean solely on their statement regarding the content. With the development of technology, the creation of identical copies of documents or of evidence material, in general, became simple. The rule of the best proof is whether, in relation to the presented material in its original form, there may be disputes about the authenticity, reliability, or accuracy of the evidence material, and in that sense, if possible, the original material should be presented as evidence.

With the advancement of digital video, the notion of digital proof has been introduced. IOCE (Internatuional Organization on Computer Evidence) was established in 1997. TWGDE (Technical Working Group for Digital Evidence) held its first meeting on 17 June 1998 to develop organizational procedures and relevant documents. The Federal Criminal Laboratory in the United States was established in February 1999. The SWGDE (Scientific Working Group for Digital Evidence), or TWGDE, changes its name to the SWGDE (Scientific Working Group for Digital Evidence), which meets at least once a year. SWGDE members are sworn in (judicial organs) and non-swearing experts, and these are scientists. The FBI is sponsoring SWGIT (Scientific Working Group in Imaging Technologies) for the electronic processing of data and images for the needs of the justice system after defining and specifying the terms for acquisition, storage, processing, analysis, transmission and the output format of photography. (Whitcomb: 2002)

77 (http://dujs.dartmouth.edu/2013/03/computer-forensics-in-criminal-investigations/#.WucT_y5ubIU)

5. ANALYSIS OF THE CASE "DARCODE"

In 2015, the Macedonian police in a joint and coordinated action of the police and the judicial authorities at international level undertook measures and actions to detect the hacker forum and its users called "DARKOD". This forum has involved more hackers and users from more countries around the world who have worked to improve their hacker experience, malware and botnet networks, and have involved other partners for their spam activities and viruses. The operative action was carried out in coordination with the FBI, with command headquarters of the action stationed in Pittsburgh USA and The Hague at Europol's European Cybercrime Center. Police services from 20 countries in and out of the European Union took part in the action: the USA, the UK, Australia, Brazil, Canada, Croatia, Colombia, Cyprus, Denmark, Finland, Germany, India, Israel, Latvia, Nigeria, Republika Srpska (BiH), Romania, Serbia, Sweden, the Republic of Macedonia, etc., and 28 detentions and 37 house searches were carried out and a large number of computers and computer equipment were seized.

"DARCODE" is the most popular forum in English of the five best ranked criminal forums around the world. A few years ago, 250-300 active users formed a closed community whose membership was acquired solely by invitation and after verification by a trusted person on the forum. Criminal activities consisted of trading in objects and services including malware, computer attacks exploiting software shortfalls (Zero-day Exploits) and access to compromised servers, ranking their hackers and stealing bank data from payment cards and extracted funds, rented botnet networks and made computer attacks.

In the Republic of Macedonia, the activities were realized by the Ministry of Interior - the Sector for Cybercrime and Digital Forensics. They conducted searches in the homes and other premises of two people from Skopje and Probistip. During the searches, several computers, mobile phones, and other computer equipment that was submitted to the expert examination were found and seized for the purpose of providing relevant evidence. A person from Stip was arrested at the age of 25 and criminal charges were brought against him because of the existence of dreams of suspicion of committing a criminal act "Making and using a fake payment card" according to Article 274b, Art.3v in Article 1 and 2 of the Criminal Code of the Republic of Macedonia.

During the period of 2011, the suspect, using malicious softwares, obtained bank data from foreign citizens via the Internet, and then used them for the purchase of various luxury items, but most of the banking data from foreign citizens sold them to other people, i.e., he sold them on several websites which are created for selling illegally acquired bank data from payment cards. These web pages (forums) were created and maintained by him. From the sale of bank data from payment cards on the Internet a large amount of cash was acquired, which was most often raised through the "Western Union" Fast Money Transfer Service, where foreigners from several countries were paying money from Mexico, Lisbon, Russia, China, the USA, and others. According to the financial documents, the suspect acquired a property benefit of 82,601.00 USD and 71,358.00 dinars'.[78]

78 https://vesti.mk/news/6003585/i-mvr-se-pofali-deka-uchestvuvale-vo-razbivanjeto-na-najpopularniot-sajberkriminalen-forum-darkod

6. CONCLUSION

Computer crime in the future will be more and more a crime with a wide range of criminal activities, which will be conditioned in the criminal goals of the perpetrators. The network of criminals will be more pronounced, their criminal association in international organized criminal groups that communicate electronically are grouped in special forums, use developed criminal schemes, create methods and use sophisticated means and techniques adapted to the criminal realization and realization of criminal proceeds , but also directing them to safe places outside the reach of the prosecution authorities and avoiding confiscation. This is precisely the reason for the development of international co-operation for the criminal investigation of cybercrime, but important preconditions are needed. It is harmonization of the national legislation by incriminating the same or similar criminal acts, defining procedural procedures, measures and actions for providing digital evidence acceptable to the judiciary and establishing cooperation at several levels. This is also foreseen with the special bilateral and regional legal acts adopted to help and support the countries in combating cybercrime.

Criminalistic research implies a system of measures and actions and their tactical and planned undertaking in criminalistic research as a specific type of research where computer forensics and the provision of relevant digital evidence come to light.

The Macedonian police continuously follow the guidelines and achieve appropriate results especially in the international operational actions involving the Macedonian police for clarification and provision of evidence resulting from criminal activities of our country, involving the perpetrators of citizens of the Republic of Macedonia. The application of legal measures and actions provides evidence of committed crime, evidence of networking in international criminal groups and evidence of acquired criminal proceedings from committed computer crimes.

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NIKOLA TESLA`S TELEFORCE - THE ”DEATH RAY” MACHINE

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ABSTRACT

It is well known that Nikola Tesla was a brilliant inventor. His inventions have advanced the World. His research work can be analyzed by the numerous interviews he had given to various media.

The subject of this research is Nikola Tesla`s *teleforce technology* (the so-called “death-ray” or “death beam”) and his inventions in that field. This technology has its root back at the beginning of the 1930s. The press called it a "peace ray" or “death ray”.

For the purposes of this research, the method of content analysis will be used as the main method.

Through Tesla's numerous statements on this topic, the authors of this paper will try to explain the seriousness of this technology.

Key words: Nikola Tesla; teleforce; death-ray; defensive weapon; directed energy weapons;

1. INTRODUCTION

The “death ray” or “death beam” was a theoretical electromagnetic weapon at the beginning of the 20th century that was claimed to have been invented independently by Edwin R. Scott, Harry G. Matthews, Guglielmo Marconi and Nikola Tesla, as well as others. Nowadays, such weapons are technically known as directed-energy weapons-DEW.

Nikola Tesla was the one who claimed to have invented the "death beam" in practice which he called “*teleforce*” in 1934 (New York Herald Tribune, *July 11, 1934*).

Tesla explained that his invention does not contemplate the use of any so-called “death rays”. His concept of a “particle beam” was quite different. According to him, this weapon should have been used for defensive purposes. The invention itself made him an optimist about the prevention of World War II. Many indicators show that nowadays various variants of this weapon have been developed and actively used by military structures. Tesla's entire scientific activity can be analyzed through the numerous interviews he had given to various newspapers at that time.

Therefore, the main hypothesis for the purposes of this paper will be:if the concept of teleforce is used for malicious purposes, it is a real threat to security in general.

2. TELEFORCE TECHNOLOGY

"Teleforce" is a defensive weapon invented by Nikola Tesla that accelerates pellets or slugs of material to a high velocity inside a vacuum chamber via electrostatic repulsion and then fires them out of aimed nozzles at intended targets. After studying the Van de Graaff generator, Tesla claimed to have conceived it. He described the weapon as being able to be used for anti-aircraft purposes in a time of war.

In a letter that was written to Jack Pierpont Morgan, Jr. on November 29, 1934, Tesla described the weapon:

> *"I have made recent discoveries of inestimable value... The flying machine has completely demoralized the world, so much that in some cities, as London and Paris, people are in mortal fear from aerial bombing. The new means I have perfected afford absolute protection against this and other forms of attack. ... These new discoveries, which I have carried out experimentally on a limited scale, have created a profound impression. One of the most pressing problems seems to be the protection of London and I am writing to some influential friends in England hoping that my plan will be adopted without delay. The Russians are very anxious to render their borders safe against Japanese invasion and I have made them a proposal which is being seriously considered."* (Twenty First Century Books. Tesla FAQ., 2018).

Nikola Tesla in 1934 announced his invention of a beam of force somewhat similar to the death ray of scientific romance. The beam, as described by Tesla to numerous reporters, would be projected on land from power houses set approximately 200 miles apart and would provide an *impenetrable wall* about a country in a time of war. Anything with which the ray came in contact would be destroyed. Armies would be wiped out, planes would fall and even the smallest country might so ensure "security" against which nothing could avail (New York Sun, 10.07.1934).

Tesla says: "*It is capable of destroying an army 200 miles away; it can bring down an airplane like a duck on the wing, and it can penetrate all but the most enormous thicknesses of armor plate*". Since it must be generated at stationary power plants by machines which involve four electrical devices of the most revolutionary sort, Tesla considered it almost wholly a *defensive weapon*. In peace times, he said, the beam will also be used to transmit immense voltages of power over distances limited only by the curvature of the Earth. Tesla was not willing to describe specifically the instruments of that discovery, or even to disclose the principles upon which it was built. He came to the idea of a beam of force, because of his belief that no weapon has ever been found that is equally successful both offensively as defensively, i.e the perfect weapon of defense would be *a frontier wall, impenetrable and extending up to the limits of the atmosphere of the earth* (New York Herald Tribune, *July 11, 1934*).

*"Such a wall, is provided by his beam of force. It is produced by a combination of four electrical methods or apparatuses. First and most important is a mechanism for producing rays and other energy manifestations in free air. Hitherto vacuum tubes have always been necessary. Second is an apparatus for producing unheard-of quantities of electrical current and for controlling it when produced. The current is necessary as power for the first mechanism. Without this, no rays of sufficient strength could be produced. The power necessary to achieve the predicted results has been estimated at 50,000,000 volts. The third is a method of intensifying and amplifying the second process, and the fourth is a method of producing tremendous electrical repellent force. A country's whole frontier can be protected by one of the plants producing these beams every 200 miles. Nor should they be much more costly than an ordinary power plant." (*New York Herald Tribune, *July 11, 1934)."*

"Death beam" machine described by Tesla.

The beam of force itself, as Tesla described it, is in fact a concentrated current no thicker than a pencil — of microscopic particles moving at several hundred times the speed of artillery projectiles, which is impressive. The machine into which he combines his four devices is, in reality, a sort of electrical gun. Such beams or rays of particles now known to science are composed always of fragments of atoms, whereas, according to Nikola Tesla, his beams are of microscopic dust of a suitable sort. The main differentiation between his and the present rays are, however, that his are produced in free air instead of in a vacuum tube. The vacuum tube rays have been projected out into the air, but there they travel only a few inches, and they are capable only of causing burns or *slight disintegration* of objects which they strike (New York Herald Tribune, *July 11, 1934*).

Nikola Tesla, in an Interview from September 1940 stated that airplane motors would be *melted* at a distance of 250 miles, so that an invisible Chinese Wall of Defense would be built around the country against any attempted attack by an enemy air force, no matter how large. This "teleforce" was based on an entirely new principle of physics that "no one has ever dreamed about", different from the principle embodied in his inventions relating to the transmission of electrical power from a distance. This new type of force would be able to operate through a beam one-half one-hundred-millionth of a square centimeter in diameter. He said that the beam would be all-penetrating (New York Times, 22.09.1940).

The "death ray" would consist of particles driven electrically and projected in vast curtains, miles high and 100 miles long. The speed of the particles — traveling at velocities of 50,000,000 volts — was described by him as giving the ray its destructive powers. The "death beam", Tesla said: "*will operate silently but effectively at distances, as far as a telescope could see an object on the ground and as far as the curvature of the Earth would permit it. It will be invisible and* ***will leave no marks behind it beyond its evidence of destruction****.An army of 1,000,000 dead, annihilated in an instant, would not reveal even under the most powerful microscope just what catastrophe had caused its destruction. The net result of the latter, will be to establish the supremacy of the battleship over the airplane, and to make the nation with the largest and best equipped battleships supreme over the seas. Submarines would become obsolete, as methods for detecting them are so perfected that no advantage is gained by submerging. And once found, the death-*

beam could be employed to do its work of destruction under water, though not as effectively as in the air" (Brooklyn Daily Eagle, 11.07.1934; New York Times, 11.07.1934 b.).

In 1937, Nikola Tesla wrote a work dealing formally and systematically with that subject, "*The Art of Projecting Concentrated Non-dispersive Energy through the Natural Media*", concerning charged particle beam weapons. It was his attempt to explain the technical description of a "superweapon" that would put an end to all wars.

2.1. Teleforce technology ("death beam") described in the letters of Nikola Tesla to his relative Sava Kosanovich from 1941

On 27th of February 1941, Tesla wrote a letter to his relative Nikola Kosanovich in Belgrade:

> *"I have recently produced a new principle of transferring unlimited power to the full defense of our dear homeland. That force that I practically showed will give Yugoslavia a terrible power because it will be possible to destroy every device, to fire a gun, etc. I will explain everything through our diplomat. I am overjoyed at the thought that I`m helping the homeland."*

The new Western Union telegram from 01st of March 1941, contains the following content:

> *"I thank Dr. Macek and you for the happy news. It is important that you know the following: [In] eight years I developed a new title using 50 of my patents of which one third are not applied. In the system there are no electrons. Energy goes into the same direction without any distribution [dissipation] and the same on all sides of distance. It contains neutrons. [In] the air [its size] is equal to a diameter of hydrogen. It can destroy the largest ships afloat. There is unlimited distance of travel. The same is for airplanes.*
> *One will need nine stations: for Serbia; three for Croatia and two for Slovenia and everyone needs 200 KW which can defend our dear homeland against any type of attack.*
> *The contents of one bomb can be exploded in the air. I add that in the station one must have a small generator or battery of 30 volts for activation.*
> *Express my deepest respect to Dr. Macek and accept the warmest greetings and thanks.*
> *Your uncle, Nikola Tesla."*

Three days later, Tesla sends anothertelegram to his nephew Sava, which is with the following content:

> *"As though I am poor with words. I still didn't explain it enough what would be necessary to increase up to twelve stations: eight in Croatia, each of the same construction like at Wardenclyffe and only 20 meters*

high - a ball five meters in diameter - the station would be using diesel oil for energy with mechanical action - my air turbines, steam powered, electrically or other manners of transforming into alternating electrical current with sixty billion volts pressure without danger. I am waiting for Governor Subasic to select one station on top of Mt. Lovcen. There will not be any light, electrical energy will deliver particles through space with the speed of 118,837,370,000 centimeters per second. This is 394,579 the speed of light. As I said about airplanes it can be used for tanks, trucks, automobiles and various machines in factories, with hydroelectrical wheels and unlimited other machines. The particles can be larger than that of the diameter of an Hydrogen atom with metals of all kinds of materials and sent to all distances and good results in war and bring about peace. Particles are practical with neutrons, because, they are 3,723 times lighter than electricity or electrons that cannot penetrate space for great distances. In my attempts with an effective 20 million volts, electrons carried 40 times more electricity than normally and penetrated two meters in depth and terrible damage in a moment each. I have to finish because that I give you a fresh view.

Warm Greetings, I remain your uncle, Nikola."

At the age of 81, at a luncheon in his honor, concerning the "Death Ray", Tesla stated: *"But it is not an experiment.... I have built, demonstrated and used it. Only a little time will pass before I can give it to the world."* (Seifer, 1996).

2.2. Nikola Tesla`s offer to Alexander I King of Yugoslavia

It is necessary to indicate one data that is very important and is related to this matter. In the second half of the 1920s, Nikola Tesla sent a letter to the Kingdom of Yugoslavia, personally to King Alexander I. Alexander sent that letter to the Academy of Sciences of the Kingdom of Yugoslavia and to the Army. In the letter he offers to King Alexander I this defensive weapon "teleforce" for the defense of Yugoslavia from an external aggressor. However, due to the lack of knowledge of this technology, the Academy of Sciences of the Kingdom of Yugoslavia advised King Alexander that it is better for Tesla to come to Yugoslavia in order to create this weapon himself because this scientific matter was unknown to them. After that, the whole process came to a stop.

3. RUSSIAN CONNECTIONS

The first letter from Joseph Stalin about the death of Nikola Tesla was published in the monograph "Nikola Tesla - Light That Does Not Extinguish". The cooperation of Tesla with the Soviet Government was officially established in 1935 when he gave them his four patents. The titles of these four patents remain unknown until this very day. The Russian Patent Office keeps the texts of these patents. In 1935, Tesla gives an interview to the "Liberty" magazine, in which he announces his two inventions - *telegeodynamics* - a technique for transmitting mechanical energy remotely, and a new weapon, *teleforce*, the so-called "death rays" (Vecernje Novosti., 2009).

"Nikola Tesla - a friend of Lenin, an artist, philosopher and a brave adventurer in science, people are deeply saddened by you. You gave them far more than you ever received. You will miss your associates in inventions and science. Such people, like you, are irreplaceable."

Troy, N, Y; USSR January 13, 1943. Joseph V. Stalin of the USSR

Written by Robert Kemp, Chief Engineer and Inventor, USSR

Tesla followed his contact with the Russian Trade Representative in New York and in April of that same year he signed a contract with Amtrog Trade Company to protect the Soviet Union from hostile aggression by building an impenetrable energy wall. In compensation, Tesla was supposed to get $ 25,000 (Vecernje Novosti., 2009; Abramović, 2015:113-114).

The only two countries that could have been involved in the project, under the terms of the treaty, were the United States and the Kingdom of Yugoslavia. Tesla gave the Russians his four patents for secret weapons. In fact, it is a patent, the so-called ***scalar interferometer*** explained in four parts. This Tesla invention based on space distortion raises ***a wall of ionic plasmaand makes a unique electronic shield***. Through this wall nothing can pass which is from molecular and atomic structure, but it breaks down to plasma. In this way, *matter becomes energy*. This practically means that every bullet, cannonball, tank, or military ship in the collision with the "Ionian wall" breaks into the core and the electrons, i.e. it turns into a large bright ball (Vecernje Novosti., 2009; Abramović, 2016:136).

After the project was sent to Moscow, Russia by Soviet experts, it was followed up by a short correspondence with Tesla. They did not get it right, so cooperation was interrupted. Or, was it? From that moment on, all information on further Russian activities on this weapon was given the status of "strictly confidential". Tesla then began negotiations with the British government, with the Prime Minister Neville Chamberlain on the sale of another secret weapon, which worked on a similar principle. For England, he designed a system of fireballs. He imagined that using two electric frequencies would produce ballistic lightning, which could destroy, remotely, ships and planes. The state that would use this patent would be protected against attacks from the sea and air. The English government then decided that Tesla would be paid $ 200,000,000 for the project. The implementation of the contract, however, did not occur and Chamberlain was replaced because he signed the Munich agreement with Adolf Hitler. Winston Churchill came to his place and he stopped the whole process. He said that he cannot give the safety of England to a man of eighty years. The money was given to the English Navy (Vecernje Novosti., 2009).

4. THE DEATH RAY IN THE DOCUMENTS OF THE FEDERAL BUREAU OF INVESTIGATION (FBI)

In the documents of the Federal Bureau of Investigation(FBI), this kind of weapon is mentioned under the name of “death ray” which represented an impenetrable “wall of force”. This so-called "death ray" was specifically mentioned in the 25th of July 1957 letter addressed to the FBI Director. We can find the same matter in the document “Abstracts of Dr. Nikola Tesla`s writings retained as exhibits for the alien property custodian”, prepared by John G.Trump, Technical Aide from the Massachusetts Institute of Technology-MIT, dated from 30th of January, 1943. The same document can be found in the third part of these documents, under the name “Nikola Tesla Part 03 of 03” (The Federal Bureau of Investigation – FBI Records The Vault:54,55,182).

Bloyce Fitzgerald, a Tesla`s protege, said in an interview with a government official that he told him just a month before his death that his experiments with this new “superweapon” had been completed and perfected (Russia Today, 29.09.2016).

In these documents we can observe the frequent emphasis of Nikola Tesla's reputation as a great inventor.

5. CONCLUSION

The afore- stated leads to the conclusion that Nikola Tesla succeeded in creating the super-weapon which had a defensive character. He, as far as his patents are concerned, had used the following tactics: he would give the codes of the invention to the four states which were very important at that time: United States, Canada, Russia and England; but it was necessary that all four countries met and synthesized the data together, because only in that way the invention would be functional. In this way, all four states would have the same weapon and the war would become meaningless.

All data supports the hypothesis: if the concept of “teleforce” is used for malicious purposes, it is a real threat to security in general.The different variants of this weapon were anticipated personally by Nikola Tesla. If we take into account the progress of technology that explores these aspects of science, we can only imagine what kind of weapons are nowadays created and used in practice. And there is an increasing number of indicators for their application. These weapons are often tested in the armed conflicts around the World.

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TOWARDS DETERMINING THE SUBJECT OF FORENSIC ECOLOGY

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Reason for writing and research problem(s): The importance of the environment in the context of its increased ambivalence with the economic development, as well as the need for its protection and promotion, contributes to the fact that Environmental crime represents part of everyday life. The characteristics of this type of crime include: high profits, international dimension, specific differences in the developed and the countries in development, different perceptions of the people, etc. The characteristics of this crime include, inter alia, specificities in detecting traces and evidence of this type of crime while taking procedural and material actions.

The field of environmental forensics has expanded greatly in the past 20 years, growing from a specialized data analysis focused on analytical chemistry data into a multidisciplinary, multifaceted range of applications of chemical, geospatial, historical, hydrogeological, and geochronological data combined with powerful statistical and other data analytics, such as transport modelling. Likewise, the motivations for conducting environmental forensics studies have expanded as well. Manu early applications of environmental forensics were for oil spill identification (Bentz, 1976) – studies that were driven by early national and international laws. (Boehm & Murphy, 2015, p. 4)

Aims of the paper (scientific and/or social): Hence, the paper will attempt to give a theoretical basis for review of forensic ecology. It is based on a Literature review the Author had made i.e. an overview of the theoretical findings on the basic questions and conceptual determination of the meaning of forensic ecology and its specifics.

Methodology/ Design: The paper follows the qualitative approach. Through discussion of the basic postulates of the findings of forensic ecology, aiming to create a fund of organized knowledge in an area that is in the initial stage of research in Macedonia and its surroundings.

Results/ General Conclusion: Scientific review of the knowledge related to Environmental forensics to address the differences that are present during the investigations of Environmental crime, thus creating basic theoretical knowledge base for additional academic discussions.

Research/ Paper Validity: Review of the areas of scientific research in Forensic Ecology, Attempt to structure the field of interest.

***Keywords*:** environment, forensic, ecology, crime

1. INTRODUCTION

Forensic ecology represents a true field of research with an interdisciplinary approach including chemical, biological and physical methods which are used in combination within a specifically established legal framework in order to determine the source of a particular endangering activity and to establish the state of the environment.

The social norms change over time in every sense of the word, especially in terms of the environment and its pollution. This situation is for the most part being a result of a better understanding of the risks associated with different chemicals, as well as the awareness raising and the need for a healthy environment. As a result of these social changes, laws are amended in order to meet our expectations. High pollution rates 200 years ago may have seemed a reasonable price for industrialization, but some of these chemicals are still present in the form of polluted soils, groundwater, or seas. Regarding forensic ecology, it is critical for us to determine the source of any pollution, both geographically and within the legal framework. Historically, environmental considerations did not begin a few decades ago, but centuries ago.There were scientists who considered the resource scarcity at the end of the 18th century! However, economic and technological progress became more necessary during the last centuries, and the cost to the environment had and has to be paid, even if all were aware of it, then and now. And, of course, historically speaking, people were not aware, which further complicates the understanding and the consequenses.

The field of forensic ecology is expanding considerably in parallel with the development of the industrial and the overall, we would say, complex life of man. Namely, today forensic ecology is a multidisciplinary, multi-faceted range of applications of chemical, geospatial, historical, hydrogeological and geochronological data that are combined with other numerous statistical data, with applications such as transport modeling. (Mudge, 2009, p. 2) Also, the motivation for the existence of forensic ecology studies has increased. Of course, this is a direct result of the increase of Environmental crime, and in particular it is related to its estimated value. Most of the initial investigations on forensic ecology were related to determining the sources of oil spills. Although forensic ecology associated with the petrochemical industry is still a very active field for research, at the same time the methods developed within this field (the petrochemical industry) are constantly being upgraded, new methods related to chemical and other conditions continue to emerge and thus contribute to the scientific field of Forensic ecology to be considerably dynamic.

Forensic ecology can be explained as an inquiry into what is in the environment, from where one particular situation arises, and as use of data in order to determine the responsibility for eventual incrimination.

Almost 40 years ago there were Western theorists who raised the question of the existence of forensic ecology and thus they opened that subject of interest. For example, in those times, the basic problem of lack of understanding between scientists and lawyers was pointed out. (Willard, 1980)

2. CENTRAL ISSUES IN FORENSIC ECOLOGY

What, Where, When and Who?

In practice, the investigations related to forensic ecology rely on three pillars. The first is to obtain information about certain chemicals that have been left out. Chemical characterization and/or delineation of the polluted site, whether on land, water, air or in groundwater, further provides the basis for determining the framework of the necessary scenario for solving the problem. The second pillar is to determine the historical context and the timing of the emission of chemicals in the environment. These previously mentioned two elements form the basis for the synthesis of the third element: determining responsibility, and finally allocation of a proportionally measured responsibility for harmful contamination.

Chemical Composition and/or Related Pollution

To put it simply, this process needs to determine the boundary, that is, to establish clearly and unequivocally the situation at the place before and after the pollution occured. Initially, of course, the answer to the four central issues that are listed above is required. These conditions are particularly useful in the context of remediation, as defined in Article 120 of the Law on Environment of the Republic of Macedonia.

The main objective with regard to the on-the-spot investigation, i.e. the environmental assessment, is:

- Determination of the nature of the site contamination, including which chemicals are being present, and also their concentrations in the various media of the Environment;
- Detailed explanation of the range of contamination in all three dimensions;
- Risk assessment of human health and the environmental receptors;
- Assessing the need for cleaning, potential approaches and costing.

The result of the investigation that in the material sense is related to forensic ecology depends on the process of information development at the place where the environmental degradation took place. At any place of the event, the historical context of the use of the soil, the water or the watercourses must be taken into consideration because some industrial facilities are certain to have been or are being present in that area. The information on some chemicals that could be a cause of concern, that is, those chemicals that were the cause for remediation - is obtained by collecting samples in order to determine the degree of contamination of a particular place. The site investigation usually involves acquiring knowledge about the environmental conditions above and under the surface of the soil, the transport of pollutants, and hydrogeological details of the place. The investigation at the scene is irreplaceable in terms of gathering the necessary information and this is the only time and place that can provide information in order to establish the objective reality.

Historical Pollution and Determination of the Real Condition

World's legislation recognizes the state of historical pollution, and this, of course, is directly related to determining the responsibility of a particular subject in relation to a criminal-legal event against the environment.

Most of the literature related to forensic ecology elaborates the chemical details of the data source, their differentiation and distribution - statistical or otherwise. (Boehm & Murphy, 2015, p. 4) The change in ownership of the legal entities is also an extremely important element, since it directly affects the determination of a particular legal responsibility, of a person or a legal subject. It is also interesting to note the state of the river flows, especially those that are irregular, practically that change over time and therefore it is quite complicated to determine the specific subject whose liability should be a subject of interest.

According to Murphy, the basic tools for historical reconstruction are:

- Time series of airborne photos, in some countries available since the 1920s (for example Britain);
- Fire Insurance Maps, available in Britain since 1867, (which of course is not the case in Macedonia);
- Changes in the industrial processes, such as well-known dates of application and cessation of the use of certain additives in the fuels in the 20th century;

- Geochronological mapping of sediment cores using lead and other isotopes, as well as identifying pollutants at different depths of the nuclei;
- Determination of groundwater contamination time;
- Determination of the discharge time of residues from the decomposition of chemical elements (e.g. chlorinated solvents).

Determination of Liability and Measurement of Contribution

The characteristic of the presence of chemical substances and their distribution at a particular site, together with the data of historical pollution caused by the release of chemical substances, is the basis for answering the questions about "who and when" - that is, determining a specific legal responsibility, which according to the categorization of Murphy completes the theory of the forensic ecology investigation.

Crime Scene Management

Appointing a person in charge is the first and foremost thing in the investigation as this person will take care of the conduct of those present at the scene and this is set out in the procedural laws governing the criminal matter. The responsible person should establish an investigation strategy, compose a team that can effectively identify and process the necessary data derived from the site. The person in charge must ensure that the team is complete and, if necessary, assign responsibility to a person for particular activities in the site investigation. It goes without saying that the person in charge must have leadership capabilities, excellent communication skills, both with the persons and entities involved, as well as the ability to communicate with the public, if required. With his expert knowledge and leadership skills, he must address the media and society by providing the basic answers to the most general questions that will not harm the investigation, yet ensuring transparency at the same time. When it comes to the Republic of Macedonia, in some ideal conditions, we consider Public Prosecutors to effectively use their original competence and be in charge of crime scene management, rather than turning to the Ministry of Interior. If this is complied with, they will be the responsible persons for the above needs, which, of course, will correspond to their position in the Law on Criminal Procedure.

Identification of Sources

Determining the persons or the legal entities responsible for a particular situation in which the environment is being endangered is crucial to the success of the legal proceedings. Part of the forensic work is to determine the source of the pollutant, which could be biological or chemical, but also establish the path on which these materials have reached the critical site.

3. FIELDS (AREAS) OF FORENSIC ECOLOGY RESEARCH

Considering the conceptual determination of the environment as everything that surrounds us, all living and non-living world, as well as the definition of ecology as a scientific discipline that studies the interaction of living organisms and their interaction with the environment, we can conclude that forensic ecology as a scientific sub-discipline of forensics uses a number of methods from natural (e.g. biology, chemistry), technical (e.g. construction, architecture) and social sciences (e.g. law, economics) into a particular legal case in order to objectively determine a certain situation which in a legal sense

represents a relevant event in order to establish the objective condition, the causes for the event and finally identify the responsible person or subject.

As a scientific sub-discipline, forensic ecology is still nascent, especially with respect to the avaibale papers and the unification of the discipline structure. As in most cases, practise prevails theory. Most papers that can be found are some kind of of handbooks, in which people from different areas write about one of the numerious aspects of forensic ecology. In our country, there is no comprehensive overview of the meaning of forensic ecology, so I will make a modest attempt to specify what is actually the core of this very important sub-discipline - forensic ecology. I certainly do not pretend that this is a comprehensive review and I do not think that the text below is final, but having in mind the papers and books published in this area, it definitely becomes an opportunity to explore a number of areas:

3.1. Forensic Ecology and Determining the Importance of Source Identification

The scientific community takes samples and determines the sources of materials in these samples for many years, which represents the basics of forensic ecology - identification and determination of the sources that are taken from the environment. Forensic ecology is an inquiry into determining what is there that exists in the environment and where it comes from and it uses these data simultaneously in order to sanction those who violate certain laws. (Mudge, Environmental Forensics and the Importance of Source Identification, 2008). Identifying those who are guilty of contributing to a certain critical environmental situation is fundamental to achieving success. Part of the forensic work is to identify the source of contamination, which could have a chemical or biological nature, and to specify the way in which those elements have reached the location.

3.2. Microbiological Methods and Techniques in Forensic Ecology

The application of microbiology in forensic ecology investigations involves numerous sub-disciplines including microbiological physiology, molecular microbiological ecology and microbiological biochemistry. Microbiological forensics has a large number of techniques in order to determine the pollutant in the environment using microbiological biomarkers. Many of these techniques, such as selective isolation, are well-established routines and have been successfully applied for many years. (Ball, Pretty, & Mahmud, 2008)

Numerous traditional microbiological techniques can be used to track a particular microbiological population in the environment. Namely, microbiological forensics can be applied on both soil and water, although most of the application is on soil. The main feature is that microorganisms represent an indicator for a particular moment in which the pollution has occurred.

3.3. Spatial Aspects of Biomarkers and Stable Isotopes in Forensic Ecology

The analysis of the stable isotopes complements the other analytical approaches for the purpose of chemical identification in a particular environmental investigation, because stable isotopes provide added value that further characterizes certain evidence. The analysis of the composition of the stable isotopes of a certain material which is abundant in nature provides the methods and ways in which we can distinguish between certain pieces of evidence which are identical in their chemical composition. The study of stable isotopes

for the purpose of their application in forensic ecology is based on the ability of the isotopes to measure very small differences that occur naturally in a state of abundance of heavy (rare) to light (often) stable isotopes in a given material and then link that composition to the isotope with other specimens of other evidence. (Ehleringer, et al., 2008)

The concept of biomarkers was introduced in the 1960s and early 70s by Eglinton & Calvin (1967) at the same time when significant steps were taken in the development of analytical instruments, especially in the area of gas chromatography and mass spectrometry (GC-MS) and associated auxiliary techniques, such as single ion monitoring (SIM) or multiple ion recording (MID). (Raul & Kuder, 2009, p. 115)

3.4. **Diagnostics of Elements for Determination of Petroleum Hydrocarbons in the Environment**

Given the importance of oil in modern living and its necessity, as an energy resource, being the only stable source that is able to have continuity, there is undoubtedly the need to study and determine its impact on the environment. The dominant position of oil as an energy resource is certain to be retained in the coming decades, despite remarkable progress in other, and especially, renewable energy sources. The environmental impact of oil is omnipresent and everyone is aware of it. There are numerous data indicating that leaks of oil and oil derivatives are present both on the land and in the seas. (Stout & Wang, 2008)

3.5. **Perchloride - How Much The Man Produces and What Its Effects Are**

The Perchloride represents a good example where an old pollutant (produced and used for more than 100 years) that has raised certain crisis issues in the last decades. In just a few years, our perchloride perspectives have been completely changed: first, from a useful to a harmful chemical element to the environment, and second, it was also believed that it was a human-made element, in the end we have come to an understanding that its natural creation was possible. Specifically, what was a useful chemical element (with very useful application) even for medical purposes (for hyperthyroidism) has become a threat to the environment as a result of its widespread use, endurance and its ability to mix with the thyroid function. Additionally, the perchloride remodeling can not be achieved by standard methods. From a forensic point of view, the challenge is not related to the presence of perchloride, its toxicity and resistance to degradation, but rather to unexpected increases of its presence in the environment and in the food, which is more and more likely to result from natural processes and causes, and not human actions (Petrison & Wells, p. 101) The challenge lies in determining when the perchloride occurs as a result of a natural activity, and it is the outcome of a human activity. More importantly, it is to be understood that the natural form of perchloride could be an important source, although perchloride in a particular case is obvious. If the perchloride can be found in the Atacama desert in Chile, then why could it not appear elsewhere in the world? The basic questions for a successful forensic investigation of chemical elements such as perchloride are:

- Understanding the structure of the physicochemical characteristics of the pollutant;
- Linking the pollutant characteristics to the existing environmental observations, in order to identify and predict the behavior of the environment;

- Based on the characteristics and the existing published information, an understanding of the use and the potential sources of the pollutant, as well as its possible natural creation;
- Linking the established information from the main sources with the available information on the developments in the given environment in order to identify possible sources/mechanisms of formation; and
- Using a variety of forensic methods in order to confirm or reject a potential source and determine the matching time. (Petrison & Wells, p. 107-108)

3.6. Monitoring of the Chlorinated Solvents in the Environment

Chlorinated solvents are the most commonly observed contaminants in the United States. According to estimates by the Environmental Protection Agency (EPA), trichlorethylene (TCE), a common chlorinated substance is present on average above 3% in the surface water and 19% in the groundwater worldwide. (Petrisor & Wells, 2008) Chlorinated solvents are observed in food, in human blood and the vegetation, including trees, although its presence in fruit has not been recorded so far. Such widespread distribution is a result of commercial and industrial use combined with a lack of awareness from the risks to human health and the environment in general. That is why today we have the task of coping with the threat that chlorinated solvents cause. The most common chlorinated solvents are: perchloroethylene perchloroethylene (PCE), tri-chloroethylene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), carbon tetrachloride (CT), chloroform (CF) and methylene chloride).

3.7. Groundwater Pollution and the Leading Role to Be Taken By Forensic Ecology

In recent years, the forensic research of the underground soil has emerged as a sub-discipline in the field of hydrogeology of groundwater pollution. According to Morrison & Murphy, underground forensics refers to: a systematic and scientific assessment of the physical, chemical and historical information for the purpose of developing arguments of scientific and legal conclusions regarding a particular pollutant in a given underground environment. Underground forensics involves assessing historical circumstances of a particular place, collecting data from the site, physical or chemical analysis of the methods of presenting the data and their interpretation. The basic questions in forensics are also applicable in these cases. More specifically, if we try to find an answer for a condition below the surface of the soil, we need to answer a number of questions, inter alia:

- Where? In what area of the site did the leak occur? Where are the areas that could be dangerous?
- To the question "how" we try to answer the following questions: is the leakage from leaks and discharges, a deliberate discharge, perhaps by leaking the sewerage network? Is there a discharge of various chemicals? Is the discharge occurring at different time periods? Can the exact discharge time be established?
- To provide an answer to the question "who", it is usually necessary to answer questions related to the answers about where and how, and then combine the answers with specific knowledge of the history of the place or at least the general activities that took place at the scene. It must also be noted that certain specific questions posed by forensics can vary on a case-by-case basis, depending on the pollutant concerned, the nature of the site, the condition below the surface of the soil, and the legal issues that arise from each individual case. (Feenstra & Rivet, 2008)

3.8. Radionuclides in the Environment: Traces and Data

Radionuclides from natural sources are present in all materials on earth. Since their first production in the 1940s, the human-made radionuclides have been extended to the whole planet. Altogether, they represent a wide range of elements with different chemical composition, and thus with different environmental impacts. As stated above, along with the fact that each radionuclide decays in a known process, it means that they provide powerful tools to enable conditions to trace and date the environmental processes, in order to determine the dynamics of occurrence of a particular event, which is forensically relevant. These features mean that radionuclides can in certain situations provide key information in the field of forensic ecology. Of course, it is necessary to understand when information can be provided and what its objective limits are. (Assinder, 2009)

3.9. Volatile Organic Compounds - Analysis of Water, Sediments and Soil and Their Application in Forensic Ecology

The atmosphere contains various volatile compounds that result from man (anthropogenic) or from natural sources (biogens). These constituents could have an impact and significant effects on the atmospheric chemical processes because some of them have features that are harmful to the ozone, especially the halocarbons, and some contribute to the greenhouse effect and the phenomenon of global warming. The legal and political processes in the world are seeing progress with certain results processes that reduce the presence of anthropogenic chemical compounds, which are harmful in nature. (Bravo-Linares & Mudge, 2009) This is another field in which forensic ecology has its important place. Especially considering that the research of the presence of these compounds can refer to their presence in the atmosphere, in the soil, groundwater, seas, which undoubtedly, on the whole, greatly complicates the work. An additional challenge is the life span of these chemical compounds, since some of them are slowly decaying, and hence generally represent a huge environmental risk.

3.10. Application of Molecular Microbiology in Forensic Ecology

Molecular forensic ecology can be defined as application of the molecular microbiology in forensic ecology. Molecular forensic ecology provides a meaning by which a particular profile of the microbiological community is used in order to determine the source of the pollution. (Ball S. A., Pretty, Mahmud, & Adetutu, 2009) The molecular forensic microbiology can be applied to soil and water, although most of the examples and studies are made on soil. The techniques that can be used are numerous, but the basic conclusion is: the microorganisms are indicators of a particular pollution event. In a simple example, the presence of faecal contamination in the environment can be tracked by determining the number of faecal bacteria (for example, faecal coliforms) in the environmental sample.

Regarding the pollutant-related micro-organisms the same can be described as:

- Those organisms that are a constituent part of the polluter. Sewerage is an example of an environmental pollutant that has a related microflora. In this regard, specific genes of microorganisms are used to identify and quantify the degree of contamination. In this scenario, it is good to observe a microbiological population that is capable of long-term survival in the environment, but at the same time incapable of growing;
- Observation of the microbiological population present in the environment, which could not be related to the polluting source. However, when the pollutant is released into the environment, the organisms are naturally linked to the pollutant by their utilization of

the pollutant. In this case, the identification of the microorganisms allows the identification of the pollutant in the environment, but does not quantify the changes in the concentration of the pollutant. For example, oil spill in which certain microorganisms are naturally capable of degradation of the pollutant, through which the elements of the pollutant can be determined. (Ball S. A., Pretty, Mahmud, & Adetutu, 2009, p. 195-196)

3.11. Biological Communities as a Tool in Research of Marine Parts

The Environmental investigations in the seas have different objectives ranging from ecosystem quality assessment to ecosystem research and its changes caused by global change or some other sources of instability; here we can include the influence of hazardous substances or human activities on the biological communities and ecosystems. According to Ram, the issues to be determined when dealing with environmental investigations are:

- When and how did the event happen?
- What is the source?
- Who contributed to the problem?
- What historical, industrial and regulatory practices were in place at the time?
- Did the discharge occur during a valid insurance policy?
- How much will it cost to return to its original state?
- If the return to the original condition is completed, are the costs incurred necessary and appropriate?

How should the costs be shared among the parties involved and of interest? (Borja & Muxika, 2009)

The answers to such complex issues can be addressed by various environmental experts; hydrogeologists, toxicologists, microbiologists, chemists, engineers, security experts, etc.

Marine benthic communities show dramatic spatial and temporal changes in species richness, diversity, relative abundance, and biomass. These variations are produced by the interactions of biotic (competence, depredation, reproduction, feeding, etc.) and abiotic (grain size, organic matter, depth, salinity and temperature changes, etc.) processes occurring at multiple spatial and temporal scales. Hence, the study of such variations following a human disturbance (e.g., an oil spill, dredged sediment dumping) can be very complicated in the absence of any previous monitoring design or a posterior adequate sampling strategy.

Similarly, there is a need for powerful and appropriate analysis tools allowing natural and man-induced changes to be distinguished before and after. Several metrics or approaches have been developed in order to explain and reveal the impact of stressors on marine benthic communities; these can be used as a forensic tool. Following ICES (2004), these metrics can be grouped into three classes, based upon their complexity and information content: (1) univariate individual-species data or community structure measures, (2) multimetric indices combining several measures of community response to stress into a single index, and (3) multivariate methods describing the assemblages pattern, including modelling. (Borja & Muxika, 2009, p. 221)

3.12. Multivariate and Geostatistical Methods in Forensic Ecology

The Statistical methods can be used to achieve numerous results that can be grouped into three groups: 1. Comparative statistics, where it is simply necessary to demonstrate that one set of values is greater than another; 2. Multivariate methods, where many analyzes are used to confirm a particular presence; and 3. Geostatistics techniques

that refer to a particular spatial distribution or scheme. (Mudge., 2009) This section deals with issues related to: comparisons of statistics, data collection, data storage, analytical procedures, multivariate and geostatistical methods, statistical significance and other statistical terms which are in function of determining the probability associated with the subject of forensic ecology.

3.13. Identify Sources of Air Pollution Through Modeling Techniques

The quality of the air we breathe significantly affects the health and quality of life. The World Health Organization estimates that tens of millions fall victims to air pollution annually. In many countries, air quality is even considered a key to the concept of the sustainable development. The movement of air, both in the states, and between them from a forensic point of view makes it very characteristic. In this sense, the most important thing is to determine the source of certain pollution as well as its further dispersion. (Colbeck, 2009)

3.14. Evidence and Expertise in Forensic Ecology

The procedure of proving in a legally relevant procedure according to Macedonian and comparative law, can be civil or criminal. The procedure of proving is a set of actions regulated by legal provisions that have process content, that is, they regulate the form, manner, procedure, competence, etc. Of course, the process of proving has many elements. One of these elements is the evidence. Another element is the method of its collection. The third element is the management of that evidence. The fourth element is that this evidence is legally relevant to the particular case. The fifth element is to enable them to provide the highest possible degree of probability and certainty that an event that is environmentally relevant has occurred and ultimately locate the responsible persons. The topic of proof and expertise itself is extensive, and therefore in this section we mention only some elements.

3.15. Forensic Archeology

Forensic archeology can be defined as an application of archaeological principles and methods of search, recovery and excavation not only of people, but also of any other evidence within a forensic legal, medical and/or human settlement. Perhaps the most critical point is that "the excavation of human remains results not only in finding, but also in reconstructing the activities of those people at the place and beyond (Scott & Connor, 2001, 104.)". Lately, more and more forensic archeology finds its application in dealing with criminal cases (e.g. mass graves). The first application was observed with the famous case of the liquidation of Polish officers in the Katyn Forest, investigation lead by Germany in 1943. (Litherland, Marquez-Grant, & Roberts, 2012, pp. 23-24) Forensic archeology can contribute to the potential site of the event with:

- Search, location, excavation and recording of secret tombs;
- Searching for other buried objects, including weapons and drugs;
- Investigation of suspicious space on a sunken place and altered land declared as such by the public;
- Exhumation of closed cases; and
- Contextual determination of the condition of the bones.

3.16. Forensic Anthropology

Forensic anthropology can be defined as an application of methods and principles of physical anthropology (the study of people in terms of their biological and physical characteristics) in cases of legal-medical or forensic interest. The American Academy of Forensic Sciences defines forensic anthropology as an application of the science of physical and biological anthropology into a legal process in cases of medical-relevant significance, primarily focused on the human skeleton or poorly decomposed remains of corpses. (Litherland, Marquez-Grant, & Roberts, 2012, p. 49-50) In different countries the right to perform this kind of media expertise is regulated differently. In the Republic of Macedonia, the Institute for Forensic Medicine, Criminalistics and Medical Deontology is the competent scientific and professional institution that is responsible for such issues. Anthropologists in general terms should seek the answers to the following questions:

- - The history of cases, including the date of finding the remains;
- - Circumstances in which it is detected, including whether the remains have undergone external influences; the condition of keeping the remains;
- - The context of the spatial concept of the environment in which they were found; and
- - The location of the event.

Furthermore, the anthropologists must be fully equipped.

3.17. Forensic Radiography

Radiological images are basically obtained by proportional techniques, but there are undoubtedly new techniques that engage complex computer systems, some use X-rays, and others use radioactive materials, sound waves and magnetic fields. Most of these techniques allow for digital storage. The main medical radiological photographic techniques used for skeletons or partially decayed corpses are the following:

- Radiography- a term that is mainly used for static images obtained through one-time exposure to X-rays/form of energy from ionized radiation;
- Fluroscopy - a term that describes an image that directly captures painting through continuous exposure to the rays;
- Computer tomography - a computerized X-ray machine that uses an array of photoreceptors to detect minute differences in the attenuation of X-rays emitted from an X-ray emitting tube that rotates around the body. This allows getting images that can be presented rotating around the body and images that can be rendered in 3D.

3.18. Forensic Entomology

Forensic entomology presents the insects and other arthropods in a legal context that can be divided into three main areas of application: urban entomology (e.g. insect-related food activities found in food), and medical-legal entomology (e.g. criminal proceedings in case of violent crime or unexpected death). The second is sometimes referred to as medical-criminal entomology, and this is the most specific field of research for forensic entomology (Hall, Whitaker, & Richards, 2012). The insects are omnipresent in nature and it is almost impossible not to associated them with a crime scene, whether it is because of their natural space, or later because they are attracted by the event. Since the first publication related to forensic entomology (Smith, 1986), there has been an increased interest in the field and major efforts have been made to increase the robustness of the interpretation of evidence related to insects. These activities have been considered by many

scientists (Amendit et. Al., 2010; Byrd and Gasther, 2009; Haskell and Williams, 2008; Erzinclioglu, 2000; Giennard, 2007; Golf, 2000; Greenberg and Kunich, 2002). (Hall, Whitaker, & Richards, 2012, p. 111)

3.19. The Diatoms and Forensic Science

Diatoms are extremely rich in species (less than 200 000), widespread microalgae groups (photosynthetic microscopic organisms), occurring in almost all illuminated aquatic environments, both in sweet and salt waters, from the equator to the poles. Though widespread as a group of organisms, individual diatoms react to the specific conditions of a particular environment, so typical dwellings are colonized by different species, and seasonal variations of their species may also occur. So the diatom samples will not differ only between two spiked water surfaces that have different chemical and physical characteristics, but there may be variations between groups within the same water ecosystem. That is why they are intensively used to determine the environmental condition, both contemporary and historical, and quantitative estimates based on diatom analysis can be made in relation to the type of conditions surrounding the diatoms, and which have a low origin. (Cox, 2012) In forensic terms, diatoms are most commonly used for drowning tests. Due to the fact that diatoms can be found in natural freshwater and sea water, it is very likely that they are found in the bloodstream of a drowned person. This is very likely in the spring and autumn when they are abundant and they can penetrate even the bone marrow. They can also be used to track certain evidence, where material from the crime scene is located on clothing or shoes.

3.20. Forensic Pollenology (Pollen Science)

Forensic pollenology is the scientific use of pollen and other microscopic biological entities in various criminal cases to provide links between the suspects and the scene or the victims and the venue. For example, a specific pollen profile can be found on the shoes of the suspect and the spot of the event. In this sense, the pollen and other biological microscopic elements of the environment can be used in order to present some conclusions about specific criminal events. Pollenology is a science for the study of pollen, seeds and other microscopic biological entities, which together are called palinomorphs. (Adams-Groom, 2012) It is necessary to present to the judicial authorities the evidence related to the mentioned materials obtained with the expertise of professional and skilled experts who are educated and undoubtedly competent in this field.

3.21. Forensic Botany

The sites of crime events are very interesting but at the same time very variable in nature. Those found outside and those inside, as well as the primary and the secondary face spots can contain many traces of plant origin, including grass, leaves, pollen, medicines and food. The body itself is a spot where the pollen can be retained on clothing or food can be found in the mouth and in the digestive tract, and leaves are often found on the hair or on the covers that surround the body. (Miller, Massey, & Valentin, 2012) Forensic botany is the application of botany, the classification and individualization of plants in matters that are legally relevant. The necessary knowledge in this area includes specialized knowledge in plant anatomy, their growth and behavior , the reproductive cycles of plants and their population structure, DNA and bioinformation classification schemes.

3.22. Forensic Geology and Soils

Forensic geology (also known as geoforensics or forensic geoscience) is a scientific research of geological materials, or the use of geological scientific techniques in a legal-relevant sense. Typically there are two remote but usually complementary sub-disciplines: search and search for evidence. (Pirrie & Ruffell, 2012) With the search, the geological knowledge and the range of instrumental and analytical techniques can be deployed in search of objects either on the earth's surface, buried, removed from water, sub-cavity voids (naturally made caves), but also from man-made structures such as mines, shafts and drains. Geological traces include rocks, sediments and dust, but most often the forensic context involves analysis and comparison of soil samples. Less often, samples of concrete and minerals are analyzed (for example gypsum). Geological traces are used more often in serious criminal investigations in the world and there is generally a trend of an increasing number of soil expertise and other geological traces.

4. CONCLUSION AND CONSIDERATIONS

There is no forensic or ecologist who can be skillful about all issues related to forensic ecology. The reason is simple, namely, ecology is the science of relations between all living and unliving organisms, in which interconnected, causally-determined chemical, biological and physiological processes are taking place. Therefore, the very breadth of the subject of research does not give one person the possibility to possess all the expert knowledge that is also legally-relevant in a given criminal situation. The issue is even more complicated if we take into consideration that ultimately the judge (who is no expert!) should evaluate the evidence and its relevance. Perhaps the most important thing in these situations is the need for skilled people to provide clear answers when they have no knowledge of a certain situation, that is, when their knowledge is limited. What every skilled person needs to avoid is ignoring the latest knowledge in a specific professional field, deriving deductive conclusions without examination, and interpreting data beyond a given context.

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TRAFFICKING IN HUMAN BEINGS VS. MIGRANT SMUGGLING: THEORETICAL AND PRACTICAL DISCOURSE ANALYSIS WITHIN MIXED MIGRANT FLOWS IN THE REPUBLIC OF MACEDONIA

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Background: Mixed migration flows on the Balkan Route in the period 2014-2016, as many times in the history of the Balkans, has highlighted the significance of migrations as a demographic and security threat, but also as a phenomenon associated with the operation of the local and transnational crime groups.
The terminology used in referring to migration, has imposed the need to differentiate the key terms related to migration and associated vulnerabilities to victimization, which proved to be crucial for defining the approaches of relevant stakeholders in handling and dealing with criminal offenses and the provision of humanitarian, legal and social services. In this context, the most specific are the vulnerable categories of migrant/refugees – victims of trafficking in human beings and migrants who suffered rights violations in the context of migrant smuggling.

The differentiation between the trafficking in human beings (THB) and smuggling of migrants (U.S. Department of State, 2017; (OECD, 2015, p.2) is still a key challenge for both the frontline governmental and non-governmental actors and processing further the acts of crime.

The paper theorizes the challenges and barriers coming from the understanding of the THB by the frontline workers, gaps in understanding the difference between victims of THB and smuggled migrants, and underlines the need for enhancing the capacities of the frontline workers to detect and process the acts of THB in the mixed migration flows.

Methods: The paper uses the data collected through interviews for the purposes of the Assessment Report aimed to SAFFER project and titled "Challenges in the identification and the protection of vulnerable individuals and victims of gender based violence and trafficking in human beings in the context of the current migration crisis". The interviews were conducted in three MARRI participants in the summer, 2017. Sources of data in Macedonia were governmental professionals and CSO field workers who acted as first line responders in the mixed migration flow, as well as THB sensitive physical environment in transit/reception/asylum centers. Total of five interviews were conducted in Macedonia, out of which two with professionals from governmental institutions and three with frontline CSO workers. Data collection was conducted in the period June-July 2017. Document analysis as a data collection technique was applied to relevant reports and publications issued by (inter)governmental entities (UN agencies, Ministry of Interior, National Commission for Combating Human Trafficking and Illegal Migration and MARRI Regional Center), CSOs and individual papers.

Results: The paper suggests recommendations for building the institutional capacities of the frontline governmental and non-governmental actors for detection and processing the acts of THB in the premises where persons in transit are accommodated.

Conclusion: The paper uses academic critical approach, taking into consideration the readiness of frontline workers to understand better the terminology and capacities to identify and how to further proceed the acts of THB where the persons in transits are involved.

Key words: *Balkan Route, Republic of Macedonia trafficking in human beings, migrants, frontline workers.*

Introduction

The Balkan represents a traditional route for the migrants on their way to the developed part of Europe. The Balkan Route, as an integral part of the Eastern Mediterranean route, made the Balkans significant for Europe in dealing with the migrant crisis. The large number of migrants which flooded Europe between the end of 2014 and the first quarter of 2016, tested the governmental and non-governmental capacities of the countries along the route to cope with the crisis.

The total number of arrivals on the Macedonian-Greek border was 694,679 in 2015, with a daily flow of 5,000-10,000 persons. In the period from June 19th, 2015 to December 30th, 2015, a total of 384,481 certificates[79] were issued to the foreign nationals, 207,398 of which were male, 65,076 were female, 93,892 were children accompanying the certificate holder and another 18,115 children who were travelling without a parent, to whom a certificate has been issued for the expressed intention for submitting a request for recognition of the right to asylum. In the period from January 1st to March 8th, 2016, 89,623 migrants expressed an intention for asylum, while the daily flow was limited to 3,000 persons (for refugees from the war zones only) and the Macedonian police prevented 35,177 persons crossing into Macedonia from Greece after the formal closure of the Balkan route (Pavlovski and Popovska-Aleksandrovska, 2017).

The mixed migration flow in the Balkans has opened many issues related to the risks that migrants, especially vulnerable groups face on their way to the final destination, the problems and sufferings of migrants, costs of services, their contact with governmental and non-governmental institutions, the local population and the criminal groups. In particular, an emphasis is placed on the response and approaches of governmental institutions and (I)CSOs in relation to upholding and protection of human rights and freedoms, especially in terms of the right to asylum, freedom of movement and the right to dignity, safety and life, and obtaining humanitarian assistance, protection and other types of services.

The massive migrant flows have reduced the already limited capacities of the state authorities to deal with (transnational) crime whose intensiveness and scope have sparked within the migrant crisis. The institutional approach especially refers to the capacities of the law enforcement services, coordination entities and other state and non-state service providers, related to the detection of THB related acts.

In addition to the EU engagement (thorough DG ECHO, Frontex and other forms of engagement), many other international key stakeholders working in the field of crisis

[79] The migrants need to register in the police station at the Gevgelija railway station or in the reception/transit centers located on this side of the border. There they can obtain papers (certificates) which allow them 72 hours to cross the country.

management and humanitarian action (such as UNHCR, IOM, UNICEF, UNFPA and the Red Cross) contributed significantly. They supported local and national stakeholders and CSOs in providing services, as well as in the facilitated implementation of international law and procedures and finding appropriate operational and regulatory solutions for different topics concerning all categories of persons in transit - migrants, refugees and asylum-seekers. Significant impact in supporting infrastructure development and providing humanitarian, social, legal and health services is also provided by several ICSOs, such as the Danish Refugee Council (DRC), Catholic Relief Services (CRS), Jesuit Relief Services (JRC), OXFAM, Save the Children, SOS Children Village, and many others (Mircheva & Rajkovchevski, 2017: 16-17). Following the structure of the frontline institutions and their staff present on the spot, they dominate quantitatively over the staff deployed by the national and local state stakeholders. Moreover, according to their mandate and role, most of those frontline workers have immediate contact with persons in transit accommodated in the transit, shelter and other types of accommodation premises.

Hence, taking into account the number, structure and rate of the vulnerable groups within mixed migrant flows, it is expected that understanding and actions for recognizing acts of trafficking in human beings by the frontline workers are crucial in the whole complex situation in which many migrants spend part of their time at the locations where the frontline workers perform their duties.

In addition to defining THB, the paper addresses the differences between THB and migrant smuggling, but the focus is on understanding the THB (terminology, elements of the work and the legal framework) and the developed skills for their recognition and detection by the frontline workers, directly working with persons in transit within the accommodation centers in the Republic of Macedonia.

1. Definition of THB and correlation with other types of crime

From the frontline workers perspective, being skilled for THB detection among the persons in transit and being familiar with the summary of the standard operative procedures developed by the national authorities, is preconditioned by knowledge of the definition of THB and similar phenomenona.

The definition of THB provided in the Council of Europe Convention on Action against Trafficking in Human Beings, states:

"Trafficking in human beings shall mean the recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation.

Exploitation shall include, at a minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude or the removal of organs" (Art. 4(a)).

It is necessary that the trafficking in human beings is distinguished from migrant smuggling. The latter is the subject of a separate protocol to the United Nations Convention against Transnational Organized Crime (Protocol against the Smuggling of Migrants by Land, Sea and Air, Supplementing the United Nations Convention against Transnational Crime). While the aim of migrant smuggling is the unlawful cross-border transport in order to obtain, directly or indirectly, a financial or other material benefit, the purpose of trafficking in human beings is exploitation. Furthermore, trafficking in human beings does not necessarily involve a transnational element; it can exist at national level

(Par.7 of Explanatory Report to the Council of Europe Convention on Action against Trafficking in Human Beings, 2005). A key difference is that victims of trafficking are considered victims of a crime under international law; smuggled migrants are not—they pay smugglers to facilitate their movement. However, smuggled migrants may suffer rights violations by their smugglers. Thus, better awareness of the distinctions between human trafficking and migrant smuggling can potentially improve victim protection and avoid the re-exploitation of victims (U.S. Department of State, 2017).

Some examples support the clarification and distinguishing of both terms.

THB's example: A recruiter deceived Marie into taking a job overseas in a restaurant, promising her a salary she could not pass up and helping her obtain a visa to work in the destination country. Upon arrival, her new "boss" told her she that there was no job in a restaurant and that she would still have to pay off the cost of finding her the job and transporting her to the country. He forced her to engage in prostitution and threatened Marie that he would tell her family what she was doing if she did not continue until she paid off her so-called debt. Marie is a trafficking victim: fraud, coercion, and force were used to subject her to sex trafficking.

Migrant smuggling's example: Encountering tremendous violence in his conflict-torn home country, Amir was introduced to a man who told him he could get him to another country for a $1,000 fee. The man insisted he would get Amir there safely by boat. Amir paid him for the travel and once in the new country, he never saw the other man again. There was no force, fraud, or coercion, and Amir was not subjected to forced labour or forced to engage in commercial sex acts. Amir was smuggled and is not a victim of trafficking (U.S. Department of State, 2017).

Crimes of THB violate human rights of those trafficked, most commonly the right to personal autonomy, the right not to be held in slavery or servitude, the right to liberty and security of persons, the right to be free from cruel or inhumane treatment, the right to safe and healthy working conditions, and the right to freedom of movement. For example, a pre-determined fee for entering a country illegally can – once the border crossing has been completed – be raised to an amount that the migrant cannot afford. In order to pay off this increased fee, and under threats from the smuggler to report the migrant's illegal border entry to the authorities, the migrant can end up in a situation of forced labour or sexual exploitation, making this person a victim of trafficking (OECD, 2015: 2).

The way in which the frontline workers understand the acts of THB and migrant smuggling could result in an inappropriate approach toward potential and presumed victims of both types of crime. If the understanding and detection of THB acts is mixed with migrant smuggling, detected trafficking victims may not receive the protection, services, or legal redress to which they are entitled and may be vulnerable to being re-exploited.

Visible progress in the area of regulation of national legislation and strategic documents in the area can be a strong indicator of the presence of trafficking in human beings within the migrant flows in the Republic of Macedonia, but in the same time it shows the way how the country adapts its legal framework according to the international standards and guidelines proposed by the relevant international entities working in the area of THB.

Following the international standards of the legislative regarding THB, the National Commission publishes its Annual Report, as an official governmental document. In the last report (National Commission for Combating Human Trafficking and Illegal Migration, 2017), it encompasses the advancements in adopting the appropriate strategic

documents: the National Strategy and National Action Plan against Trafficking in Human Beings for 2017-2020 and the Inter-institutional Training Plan for 2016-2017. The Training Plan refers to training on different thematic standard operating procedures[80] (SOPs) and training on indicators for identification of THB victims within mixed migration flows, as an integral part of the thematic SOPs.

2. Sources of identification of THB victims and acts

The data of relevant national and international bodies indicate that there is still trafficking in the Republic of Macedonia, and the migrant crisis is only an accelerator of human trafficking crimes among the share of local criminal groups and their connection with transnational groups whose actions with trafficking can only be polemicized.

According to the statistics presented in the Annual Report (National Commission for Combating Human Trafficking and Illegal Migration, 2017), out of 125 identified potential THB victims in 2016, 120 are migrants. 86 potential THB victims among migrants were identified by local CSOs, of whom 25 were children. The majority or 120 identified potential THB victims were detected as victims of trafficking committed outside of and before their entering the Republic of Macedonia.

The study on *Vulnerability and Exploitation along the Balkan Route* pointed out on types of exploitation in Macedonia and Serbia,

"Labor exploitation has been documented amongst male and female migrants/refugees (adults and children) in Greece, Turkey and Macedonia and some cases constituted human trafficking. […].both Serbia and Macedonia have documented cases of migrants/refugees being exploited as factory workers, agricultural workers, tailors, carpenters, mechanics and street sellers" (Brunovskis & Surtees, 2017:16). The same source on *Vulnerability and Exploitation along the Balkan Route* contains details about sexual and physical abuse of women and girls migrants in Macedonia by migrant smugglers. In some cases, as noted by Brunovskis & Surtees, "*rape and sexual assault were part of a larger scheme to extort money from families to pay for onward travel"* (2017:16-17).

As set out in a REACH Report on *Migration to Europe through the Western Balkans*, focusing on Macedonia and Serbia:

"*The introduction of border closures and incoherent migration policies across the Western Balkans has further increased the vulnerability of people in transit. People who continue to travel despite new restrictions have been forced to take illegal routes, exposing these individuals to increasing levels of personal risk including physical violence, trafficking and exploitation. Hundreds have been left stranded along the migration route in Greece, FYRoM and Serbia as a result of new policies, who face an uncertain future—unable to move forward, yet reluctant and often incapable of returning home without assistance*" (REACH, 2016: 4).

[80] SOPs for Treatment of Victims of Trafficking in Human Beings (National Commission for Combating Human Trafficking and Illegal Migration, 2010); SOPs for dealing with vulnerable categories of foreign nationals (National Commission for Combating Human Trafficking and Illegal Migration, 2016); SOPs for dealing with unaccompanied and separated children - foreigners (National Commission for Combating Human Trafficking and Illegal Migration, 2015); Indicators for Identification of Victims of THB (2014); and General Indicators for First/Preliminary Identification of Presumed and Potential Victims of THB in cases of mixed migration flows (May 2016). The abovementioned SOPs are available in Macedonian, Albanian and English, while the indicators are in Macedonian only.

The Republic of Macedonia is ranked in the TIER 2 group of states in the latest US *Trafficking in Persons Report* (US Department of State, 2017). According to this report:

"*Migrants and refugees, particularly women and unaccompanied minors, traveling or being smuggled through Macedonia are vulnerable to trafficking* […]. *Traffickers frequently bribe police and labor inspectors. Police have been investigated and convicted for complicity in human trafficking*" (US Department of State, 2017: 260) and: "*The government prosecuted and convicted the fewest number of traffickers ever reported. The government did not award any grants to anti-trafficking NGOs as it had done in past years and discontinued its partnership with NGOs that provided support services at the government-run shelter*" (US Department of State, 2017: 258).

The Council of Europe (CoE) informs about progress in combating THB, evaluation visits and follow-ups by the CoE's Group of Experts on Action against Trafficking in Human Beings - GRETA (Council of Europe, 28 February 2017). In the latest GRETA's report as of 2018, as an issue for immediate action, the national authorities are urged,

"to take additional steps to ensure that all victims of trafficking are identified as such and can benefit from the assistance and protection measures contained in the Convention; ….to improve the assistance for victims of trafficking;… to improve the identification of, and assistance to, child victims of trafficking;… to review the legislation in order to ensure that the recovery and reflection period provided for in Article 13 of the Convention is specifically defined in law;.. to facilitate and guarantee effective access to compensation to victims of THB;… to ensure compliance with the principle of non-punishment of victims of THB for their involvement in unlawful activities;... and to ensure that THB cases are investigated proactively, prosecuted successfully and lead to effective, proportionate and dissuasive sanctions" (GRETA, 2018: 42-43).

According to the Frontex Annual Risk Analysis for 2017, "*many irregular migrants become victims of forced labor or sexual exploitation at some stage during their journey to the EU. This particularly affects migrants travelling on the Central Mediterranean route via Libya and, to a much lesser extent, those migrating along the Eastern Mediterranean route"* (Frontex, 2017:27).

"[…] *humanitarian and protection actors struggle to access those in need of assistance, while law enforcement agencies lean towards blanket criminalization of all involved, including those who might have been exploited themselves* (IOM, 2015; EU Agency for Fundamental Rights (FRA), 2014, as quoted in MMP, 2017: 1). In addition, the same source predicts, *"in the absence of adequate safe, regular and legal migration pathways from the Middle East to Europe, smuggling is likely to continue, making it essential to mitigate the risk of people forced to move irregularly becoming exposed to exploitation and trafficking"* (MMP, 2017: 1).

"There are no provisions [in Macedonia] prohibiting the detention of minors (accompanied or unaccompanied), elderly people, women or trafficked persons" (Global Detention Project, 2017: 4).

Although in some cases, the media inform about police interventions and operations against groups of human traffickers, the information are rarely related to human trafficking within migrant flows (Lambrechts, 28 April 2015).

3. Practical issues

It is a fact that the statistics and reports of the relevant national and international bodies and organizations indicate that it is necessary to work on the mitigation of THB related criminal offenses, immediately with frontline workers working on the ground. This in particular concerns the development of the skills of those persons involved in the daily communication with migrants and the improvement of the measures for more efficient inter-agency cooperation. As the expectations regarding the efficiency in detection and processing of THB offenses within the migration flows should not be directed only to frontline workers, it is necessary to build a holistic and systematic multi-agency approach, with appropriate involvement of the civil sector and the academic community. It especially refers to the training and improvement of the inter-agency cooperation and coordination through data sharing.

From an **organizational** point, the competences for coordination and management of the premises for migrants in transit are under the authority of the central and partially local government. According to the mandate and defined "in-house" rules, the work of the local and international CSO stakeholders is generally focused on mitigation and response to the humanitarian dimension of the crisis, and less on identification and processing of THB cases.

Definition, forms of THB and distinguishing between THB and migrant smuggling. The recent field research, conducted for the purposes of the project implemented in MARRI (Migration, Asylum, Refugees Regional Initiative) Participants and referring to cases of THB and gender based violence within the migrant crisis, identifies several key anomalies ensuing from the work of the frontline workers (Mircheva & Rajkovchevski, 2017: 43-45). The report takes into consideration those countries from the region that had introduced THB as a criminal offence in their national legislation before more than a decade, accompanied by a number of policy documents and trainings. Thus, the basic presumption is that the interviewees (mainly frontline workers in the transit, asylum and detention centres) are well informed and have sound understanding of the elements and forms of THB. They demonstrated limited ability to identify and differentiate elements of THB and its various forms, as an issue that is particularly important in the process of identification and protection of potential victims/survivors.

The statements of the interviewees from Macedonia point to some evident remarks regarding the understanding, identification, mixing of smuggling of persons with THB and other relevant issues. The following quotes are an illustration of the afore-stated:

"Trafficking in human beings is, in my opinion, a crime punishable by law, where people usually take part by accident, and there is maximum exploitation of the victims involved" (CSO interviewee, male). It is important to note that some interviewees expressed apparent confusion about THB.

"There are several forms of trafficking in human beings, but nowadays, I can say it is the smuggling." (Governmental organization interviewee, male)

"Classical trade ….where they are transported for a certain amount of money." (Governmental organization interviewee, male)

"Exploiting them sexually, emotionally, psychologically" (CSO interviewee, male)

"There is labour and sexual exploitation, forced begging, organ trafficking…" (Governmental organization interviewee, male)

Namely, mixing smuggling of persons with THB affects the whole process of identification and protection of the concerned persons, especially when THB is perceived as smuggling. The core element of THB, for the purpose of exploitation of the trafficked

person is missing whatsoever, and the focus is on illegal border crossing. On the other hand, some of the interviewees listed various forms of THB, ranging from labour exploitation, sexual exploitation, slavery, forced begging, organ trafficking, or any other form of exploitation by using threat, force or other forms of coercion or fraud.

Knowledge about the legal framework, strategic documents and training experience. Besides understanding the elements and differentiating forms of THB within the process of identification and protection of victims/potential victims, it is necessary to have an optimal extent of knowledge of the national procedures for identification and assistance to THB victims.

All interviewees from Macedonia refer to the Standard Operating Procedures (SOPs) as a referral mechanism that defines the tasks and responsibilities, as well as the cooperation among stakeholders for identification and referral of victims of THB, GBV, unaccompanied minors and vulnerable categories in crisis and emergency situations.

"The basis for working is standard operational procedures… These are procedures, to say, that are adopted by the Republic of Macedonia, and are a way of working with juvenile persons, unaccompanied persons, victims of trafficking… For gender-based violence." (Governmental organization interviewee, male)

…"there are standard-operating procedures for trafficking in human beings, for unaccompanied minors and another vulnerable categories of people related to gender-based violence." (*CSO interviewee, male)*

The report states:

All interviewees from Macedonia refer to the Standard Operating Procedures (SOPs) as a referral mechanism that defines the tasks and responsibilities, as well as the cooperation among stakeholders for identification and referral of victims of THB, GBV, unaccompanied minors and vulnerable categories in crisis and emergency situations.

With regards to THB related training, most of the interviewees acknowledged that they had received training on THB. In the conducted interviews, the level of training received varies from basic to more specialized training. Some interviewees report that they have undergone several trainings on different aspects related to the identification and assistance to THB victims, and others stated that they had received only basic training.

Conclusion

The general findings of the sources (assessment reports dominantly) reveal that frontline workers in Macedonia are well informed, trained at all levels and have sound understanding of the elements and forms of THB, but there is still a small number of involved interviewees that are mixing THB with smuggling of persons.

Language and cultural barriers are identified as obstacles to THB identification or reporting, hence an increased presence of interpreters from languages spoken by refugees/migrants (particularly, female interpreters sensitized to the culture and tradition of refugees/migrants) could improve the situation.

Interagency cooperation among (I)CSO, governmental and local institutions is a key factor in detecting and processing THB acts. In this way, a sound cooperation among frontline workers is required and remains a serious challenge. Systemic coordination, nonprofessional attitude of some professionals and insufficient knowledge of the competences of other institutions are listed as key obstacles for efficient cooperation.

Macedonia is a rare country in the region with specific SOPs and indicators developed for identification of THB victims and supposed victims in mixed migration flows. Coordinated referral mechanisms and case management at cross-border level is still

a challenge, but there are not common identification criteria for THB victims on a regional level and only informal communication and co-ordination mechanisms exist on cross-border level. Therefore, the state institutions in the Republic of Macedonia should initiate work on adopting regionally harmonized and comparable indicators for identification of potential or supposed THB victims in the mixed migration flows.

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INTERNATIONAL AND NATIONAL STANDARDS OF POLICE POWERS

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Abstract

In the implemention of the police powers, officials apply the provisions of the Rulebook on performing police duties. This regulation stipulates that police officers identify themselves to the citizens whenever police powers are performed in civilian clothes. If they work in uniform then legitimation is performed if requested by the citizens. In all police powers, police shall act without discrimination and impartiality, and the basic right that citizens have in the relationship with the police is that every individual has the right to security of person, it is guaranteed that physical or mental pressure will not be applied on suspects, witnesses, or victims in an attempt to obtain some information, there will be no compulsion to confession, and the information collected will be treated confidentially.

In the implemention of police authority - calling police officers are required to submit a letter of invitation, and minors are invited to submit it to their parents or guardians. According to the Rulebook on performing police work, a person may be summoned verbally or through the media in cases determined by law. Detaining an authorization shall be based on the written order of a competent court and detention officer shall examine the person for the purpose of investigation and seizure of items suitable for self-harm or harm to others.

Keywords: *police, police powers, standards, rules*

1. INTRODUCTION

The Law on Criminal Procedure and the Law on Police determine the police powers of the officials that are regulated in detail in the Rulebook on performing police tasks and SOPs for containment and procedure of detainees. The specific arrangements with foreigners and minors are regulated by special laws. The law on Police is a basic legal act that defines the role of the police. Article 3 of the Rulebook stipulates that the police have the primary function of protection and respect of human rights and freedoms of man and citizen guaranteed by the Constitution, laws and ratified international treaties, protect the legal order, prevention and detection of offenses, taking measures to detect offenders, and maintain public order and peace in the society.

The arrest may be conducted without a written order when they need to determine the identity of the person for whom a warrant has been issued if caught while committing a crime prosecuted ex officio and caught in the commission of an offense involving violence. The arrest is made by an official vehicle, and for minors it should be conducted by a police officer in civilian clothes and with official vehicles without official insignia. The detention is implemented in areas designated for that purpose by a decision of the minister. If it comes to keeping the stranger they must inform the diplomatic or

consular mission of the country of their nationality detainee. All these other police powers are set out in the abovementioned Rulebook.

So in terms of determining the identity of the person, the person should be informed of the reasons why the necessary determination is conducted, while the verification of the identity is implemented by inspecting the identification document. Also, in order to find the perpetrators of crimes, police officers can collect information from citizens and for any information to prepare an official note. In the area of police powers,the search of a person and an object is also included, taking charges and other activities regulated by law and bylaws.

2. POLICE POWERS

For the successful performance of the police work, the police officers have the police powers established by the law and bylaws[81]. The character of the police powers are such that allow the police officers in their official action to get deep in the area of some of the basic human rights and freedoms and as a consequence, there is a limit and even seizure. Such police powers are determined in Article 28 of the Law on the Police:[82]

- checking and determining the identity of persons and objects
- information gathering
- reference
- retention
- arrest
- search for persons and objects
- diversion, guiding and restricting the movement of persons and vehicles in a certain area for a certain time if necessary
- warning and ordering
- temporary seizure of objects[83]
- search of certain facilities and premises of state bodies and institutions with public authorities and other companies and insight into their documentation
- stopping, examination or search of persons, luggage, and vehicles
- providing an overview of the scene
- receiving reports
- public announcement of awards
- shooting in public places
- collecting, processing, use, evaluation, transmission, storage, and deletion of data and processing of personal data under the terms and in a manner consistent with the law
- application of special investigative measures and undercover sources of data
- protection of persons covered under the regulations for witness protection.

When undertaking these police authorities and their successful execution, the police officers can use force under the conditions when it is necessary and in the manner prescribed by the provisions of the law and only to the extent necessary for achieving a

[81] Rulebook on performing police work (Official gazette no.149 from 10.12.2007)
[82] Article 28 from the Law on police
[83] Rulebook on performance of the police officers with temporary taken or found objects (Official Gazette number 62, from 18.05.2007)

legitimate target. For this purpose, they are also authorized to carry weapons and use means of coercion.

From the type and the character of the police authorities we can conclude that from an aspect of the human rights and general freedoms, they have authorities that can be malfunctioned if not used carefully and without attention. Because of that, the police officer has a legal obligation to act strictly professionally and humanly within the framework of the legal provisions, to respect the dignity, the honor, and the reputation of the people as well as to respect the basic rights and freedoms of the man and the citizen.

After all, it is a research that is part of this master's thesis, which is conducted within the project to support the human rights in the police procedure. It shows the extent and the severity of the abuses by the police officers in the execution of the police powers taken into police treatment and protection sought by citizens of their rights violated by such abuse.

The police officer in taking the measures and the activities in carrying out the police duties is obliged to identify himself or herself, especially if they perform those duties in civilian clothes. There is an exception of this rule in cases when the character and the conditions under which the powers are undertaken do not allow identifying of the police officer because that would mean missing the goal of the police work. But, as soon as the conditions approve, the police officer must identify himself or herself.

When taking police powers that have the effect of restriction or deprivation of liberty of movement, such as summoning, arrest, and detention, the police officer is obliged to inform the person of the reasons why it takes such authorization in a language understood by the person, to introduce the right to consult a lawyer or the right to remain silent, the right to counsel during the proceedings, the right to medical assistance when needed or when the person was calling, the right to inform a family member or a close person.[84]

If the person is arrested, detained, or deprived of freedom when there are grounds for suspicion that they have committed a crime, the police officers against such a person behave with respect for their dignity and individual needs. During the police actions they must not incite, provoke, or support any actions or provocations that result in torture or inhuman or degrading treatment or punishment against the persons included in the police procedures.[85]

In the case of minors, the proceedings must be taken by the police officers who are trained to work with juvenile delinquency, except in exceptional circumstances and as a rule, if possible in the presence of a parent or guardian.

3. TYPES OF POLICE POWERS

3.1. Check and determination of the identity of people and objects and gathering information

In which cases the police officer will use this power is determined in Article 38 of the Law on Police. The obligation to introduce the person the reasons for the check of their identity is very important for the protection of the human rights. The identity is proved by an ID or other document with a photo and after the officer will see the document they return it to the owner. If there are any obstacles in proving the person’s identity, they

[84] Article 55 from the Codex of police ethics
[85] Article 55 from the Codex of police ethics

may be held to establish the identity, but no longer than 3 hours, unless it is about a reasonable suspicion that the person has committed a criminal offense.[86]

This authorization means that the police officer, because of the successful execution of their duties, may collect information in direct conversations with citizens, but that information is not liable and the people are not obliged to provide information steamed in those conversations unless they wish to.

3.2. Calling

The calling is a police authorization which allows citizens to be called in with a written invitation at the police station in order to obtain information needed in policing. The written invitation must be properly made, which means that, besides the name and the surname of the person called, the police unit, date and time, the reasons for calling, the right to counsel and the consequences of not attending must all be indicated.

If the invitation with such content is submitted correctly and the citizen does not answer and does not justify their absence, they can then be brought by force, but only with a court order. Even when they are forcefully apprehended, the citizen is not obliged if they do not want to give any information and that should not be the cause for calling them at the police station again and again with a written invitation. The reference does not mean that the citizen should be held at the police station without respect to his will to leave after refusing to give any information or as soon as the conversation is ended.[87]

By rule, the calling should happen in the time period from 6.00 to 22.00 and if there are reasons for that, the calling can be made through the means of informing, or orally. The minors are called by invitation sent to their parents or guardians.

3.3. Detaining

The police authorization is strictly formal since the police officers may detain a person solely on the basis of a written court order issued by a competent court, which should be submitted for examination. From this rule there are exceptions in the following cases:[88]

- if the identity of the person cannot be determined;
- if a warrant is issued;
- if caught on the spot while committing a criminal offense prosecuted ex officio;
- if caught in committing an offense involving violence.

In cases when there are fears that the health of the detained person can be harmed seriously then the detaining is stopped. The same is applied if the person detained performs actions that cannot be stopped until there is a replacement for them.

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3.4. Retention

This is one of the extreme police powers when it comes to the free movement. A person for whom there is a suspicion that has committed a crime and a person conducted and accepted by foreign safety authority may, under the conditions and in the manner provided for in a separate law, be held for 24 hours and in the commission of an offense or a serious threat to public order for 12 hours.

Up to 8 hours police can detain a person under the influence of alcohol or psychoactive substances. After the termination of the reasons for detention, the detention is terminated.

3.5. Use of force

3.5.1. Use of mean of force

The police officer is authorized by forceful means to use force in carrying out police work. That power should be applied on grounds and in the manner prescribed in the legal provisions as appropriate, depending on the objective and subjective conditions that caused the use of force and the person against whom it was applied, and should be proportionate to the challenge and danger that should be eliminated or overcome. The means of coercion are physical force, baton, and means for tying up, a device for coercive stopping of vehicles, police dogs, chemical substances and firearms, as well as special types of weapons and explosives. The police officer should use this power only in exceptional circumstances when no other way to achieve the goal of police action should be with the least harmful consequences and stop the moment objective is reached or ceases reason for which it is undertaken.

The police officer is obliged before the use of force to identify himself or herself and clearly warn that it will be used, of course, if the nature of the proceedings so permits. However, after the cessation of the use of force, if necessary medical assistance on the person who applied this police authority, the police officer shall be provided with adequate medical attention. A torture or use of forcein order to extort a confession or any statement contrary to the will of the person at any stage of the police procedure is strictly forbidden.

3.5.2. Use of physical force

Despite the means and instruments which serve the police officer, they may in the fulfillment of the police work, when it is necessary, particularly in answering the attack, preventing the escape of a person or overcoming resistance to that person to use physical force in terms of use of various interventions martial or other gripped hands or feet to act on the body of the person who is the subject of police actions in order to subdue his resistance.

In extreme cases, when only a physical force could not overcome the resistance, the police officer is authorized to use baton as a means of coercion. There are three cases where the use of means for handcuffing is permitted, and due to:[89]

- preventing the person's resistance or rejecting an assault aimed at a police officer;
- preventing an escape of persons and
- preventing self-hurting or hurting others.

The police officer usually ties the person's hands behind his back.

[89] Article 86 of the Law on police

3.5.3. Use of means for vehicles' forced stopping

It is used in cases where the person against which the police officer is acting uses vehicles as aids to escape when caught on Article 86 of the Law on Police committing a criminal offense prosecuted ex officio, or to prevent the person arrested or an order for arrest.[90]

This means is used when there is an intention for illegal crossing of the state border, or there is a danger of violent unauthorized access to areas where the police work is performed.

3.5.4. Use of a dog

Whenever there are conditions for use of a physical force, rubber truncheon or use of firearms, and when there is a need for police intervention when disturbed public order, it is permissible to use a dog and only with muzzle on the mouth. Only in cases where the conditions for use of firearms are fulfilled, a police dog can be used without a muzzle.

3.5.5. Use of firearms against people

For successful performance of the police work, one of the most dramatic and most controversial powers that the police officer has is the authorization to use a firearm to a person. It presupposes the opportunity that the officer may endanger the health and even result in death of the person towards whom he has used firearms. For these reasons, the use of this means of coercion is only when it is absolutely necessary and when all possibilities of using other means of coercion, physical force, and rubber truncheon, police dog, chemical and forcible stopping of vehicles have been definitely exhausted.

In accordance with the Article 89, paragraph 2 of the police, "the police officer is authorized to use firearms when otherwise and by using other means of coercion they cannot:[91]

- protect their life or the lives of other people;
- prevent the committing of a crime which may be imposed a prison sentence of at least four years;
- prevent the escape of a person caught committing a criminal offense which can be punishable by imprisonment of ten years or more, or a person for whom a warrant has been issued because of an offense committed;
- prevent the escape of a person detained under a criminal case under item 3 of this paragraph, or a person for whom a warrant has been issued because of an escape from the sentence of imprisonment for such crimes,
- prevent an attack on a building or person is provided.

Always, unless if that does not threaten the successful performance of police work, before the use of firearms the police officer should shout orders and warnings with the words "Stop, police", then, if they act with the weapon before firing, they have to follow a second order "Stay, I will shoot." If the use of firearms would endanger the lives of others, then it is not allowed except in cases of immediate danger when that is the only mean necessary to protect their lives or the lives of those people.

[90] Article 86 of the Law on police
[91] Article 89, paragraph 2 of the Law on police

3.5.6. Use of chemicals, use of force against a group and use of specific types of weapons and explosives

A feature of these means of coercion is that they are used in special situations when police officers act in cases of threatened public order by more than one person, a group, or a crowd in street riots, hostage situations, but they must always take care not to unnecessarily jeopardize the health and lives of people. The use of force against a group is approached by orders of the authorized person in charge of the police action and the use of special types of weapons and explosives approved by the Director of the Bureau of Public Security.

3.5.7. Use of firearms against animals

In situations where an attack on an animal is an immediate threat to the life and body of the people or when there is danger to life or health due to an infectious disease transmitted by an animal, the use of firearms by the police officer to eliminate such danger is allowed. Firearms may also be used against ill and seriously injured animals when it is not possible to give them appropriate veterinary assistance or any other person to take appropriate measures to assist such animals. In most of their work, police officers use their powers to the processing of police interventions in cases where there are grounds for suspicion that a criminal offense prosecuted ex officio. Such police interventions must be objective and fair in their application must convey a sense of respect for the principle of presumption of innocence, and to consider the specific needs of the so-called vulnerable groups of people such as children, juveniles, women, elderly people, and people with health problems or handicapped people.[92]

4. COMMAND, CONTROL, AND ACCOUNTABILITY

4.1. Command and management

The structure of law enforcement agencies varies considerably from one country to another; some authorities may opt for a more hierarchical and centralized structure, while others may establish a more decentralized structure with a higher degree of decision-making power at intermediate and lower levels of the hierarchy. Regardless of the choice of structure, two features are common to all law enforcement agencies: a degree of hierarchy with a top down command structure and the possibility for individual law enforcement officials to exercise their discretion in their day-to-day work. This requires the commanding leadership of a law enforcement agency to create the right blend of centralized, hierarchical structure for the establishment of policies and operational standards, while allowing for a sufficient number of decentralized responsibilities and competences. With regard to the later, however, the leadership bears responsibility for ensuring that each single law enforcement action at the local level is carried out in full compliance with the rule of law and human rights.

The willingness of the people to cooperate with the law enforcement agency will depend very much on whether that agency is perceived to be legitimate, professional, law-abiding and able to respond to the local needs. It is for that reason that growing numbers of police agencies are becoming more decentralized, describing their work under labels such as “community policing,” “self-management” or “result responsibility.” The representativeness of a law enforcement agency – in terms of gender, religion, ethnicity,

[92]Article 51 of the Codex of police ethics

geographical origin, etc. has proved to be another factor enhancing its acceptance by the people, as it reduces the likelihood of law enforcement action being perceived as biased or discriminatory.

In order to ensure the legitimacy of the law enforcement agency, it is the responsibility of the commanding leadership to constantly affirm the rule of law:

- The leadership must constantly recall that only law-abiding policing is good policing and prevent a "the end justifies the means" culture or attitude within the institution.
- This needs to be reinforced through complementary measures enhancing the transparency and accountability of all law enforcement actions and through the definition of ethical standards of professionalism, integrity, and respect for applicable domestic and international law.
- Corruption is one of the greatest threats to the legitimacy and effectiveness of a law enforcement agency and it is the responsibility of each and every law enforcement official to play an active part in combating corruption.

Orders and procedures play an important role in ensuring compliance with the law and respect for human rights. In order to be effective and to ensure accountability at all relevant levels, a clear chain of command needs to be established together with clearly defined responsibilities and decision-making competences as well as the scope for exercising discretion. Supervision and control are required to ensure that orders and procedures are followed and that action is taken where that is not the case. Law enforcement is carried out by human beings and its quality therefore depends highly on the competence and skills of those human beings. The leadership should affirm the governing principles of legality, necessity, proportionality and accountability and adopt means and measures to ensure that those principles are upheld. Recruitment criteria must go beyond mere physical criteria and include the required level of education, a clear police record, personal integrity and a law-abiding attitude.

Despite the initially higher costs involved in such an approach, it should be borne in mind that in the long term this is more cost-effective than the mass recruitment of poorly qualified personnel. The same applies to efforts to attract the right people to the law enforcement service, which includes establishing appropriate levels of pay and working conditions. At the same time, if it proves difficult to recruit a sufficient number of appropriate candidates, the length and content of education and training courses will need to be adapted to the profile of the potential recruits. In managing human resources, the commanding leadership of a law enforcement agency has to bear in mind that full respect for the rights and dignity of the law enforcement officials themselves is an indispensable precondition if those officials are to uphold the human rights of those whom they are supposed to serve and protect. This includes adequate pay, respectful treatment, humane working conditions and social security cover. Furthermore, promotions should not be based on seniority but on merit, thus providing an incentive for good policing and compliance with the law.

Supervision and control are key responsibilities of the senior command leadership, which is required to ensure the fulfillment of the country's obligations under international law, in particular to ensure that law enforcement officials abstain from practices which contravene human rights law. Authorities must keep law enforcement procedures – including their compliance with IHRL – under constant review and enforce compliance with those procedures. All levels across the chain of command need to be legally accountable for compliance with the law. "Grey policing," i.e. bending the law,

cannot be tolerated. Supervision and control leads to the detection of such practices and enables corrective measures to be taken. Turning a blind eye to such practices will entail the personal accountability not only of the acting law enforcement official but also of his or her supervisor. Clear orders and standard operational procedures must therefore provide a firm basis for law enforcement action (without becoming a "straitjacket"). At the same time, adequate reporting procedures must allow for the evaluation of each action in terms of its compliance with the law and procedures. Furthermore, a culture of transparency and trust needs to be established so that law enforcement officials feel comfortable about reporting any violations of the law or procedures.

Law enforcement officials also have to be held internally accountable for complying with internal rules, regulations and procedures as well as for showing respect for the chain of command. However, in order to have the desired effect, i.e. future compliance with orders and procedures, the disciplinary system must be fair, transparent, timely and just. Other measures, such as additional training, better working conditions or counselling, might sometimes be a more appropriate means of addressing the issue. A law enforcement agency should also be held accountable to the government, the legislator and the public with regard to its overall performance, i.e. how far it meets the needs of the community that it is serving. Performance appraisal needs to go much further than merely looking at crime rates and arrest figures. It should seek to determine the level of trust existing between the law enforcement agency and the community and the extent to which the law enforcement agency is responsive to the needs of the community.

The possibility for individuals to lodge complaints about law enforcement action directly with the law enforcement agency provides the commanding and supervising leadership with opportunities to achieve the following:

- Evaluate the performance of their subordinates and of the agency as a whole;
- Assess the quality of the relationship between the agency and the public and pinpoint areas where improvement is needed;
- Win the confidence and trust of the public - which depends on complaints being dealt with in an impartial, professional and transparent manner.

Nonetheless, such mechanisms should only be complementary to external oversight mechanisms and not replace them.

4.2. Investigating human rights violations

Human rights violations undermine the government's credibility and authority and thus present a threat to peace, security and stability in a country. Law enforcement officials have an important role in the protection of human rights. Although they are required to uphold human rights law, some law enforcement officials are also potential violators. It must be understood that where those who are supposed to uphold the law and human rights commit human rights violations, the very relationship between the organization and the community is at stake.

It is therefore important to hold law enforcement officials accountable for their acts. Even a superior order cannot serve as an excuse where that order is manifestly unlawful, particularly when it comes to serious breaches of international law, such as the acts of genocide or torture. Responsibility and accountability are extended to superior officers who order human rights violations or fail to prevent them. Depending on the nature of the human rights violation, competences, procedures and possible remedies for addressing it will differ; an effective system of checks and balances involves a combination of a range of mechanisms. Authorities should not see this as a threat.

Acceptance of full scrutiny of the law enforcement work will enhance the credibility and acceptance of authorities. In addition, scrutiny should help to detect where improvement is needed and how to achieve it and have a preventive effect within the whole institution. Thus, it is in the interest of law enforcement agencies to play an active part in any investigation of human rights violations.

Where a human rights violation also constitutes a criminal offence, the law enforcement agency will be operating within its usual area of responsibility to investigate crime. It goes without saying that this needs to be carried out promptly, thoroughly and impartially. However, it remains psychologically difficult to investigate a colleague's behaviour and very close supervision is needed to ensure that the investigation is not biased. For that same reason, some police agencies have established specialized departments responsible for carrying out such investigations. In any case, success in this area depends on the existence of an institutional culture where unlawful behaviour is clearly unacceptable and where "whistle- blowing" is not perceived as "treason." It is within the remit of the commanding leadership to establish a code of conduct. Nevertheless, appropriate safeguards must also be created through close supervision of such investigations. External oversight remains in any case indispensable.

Finally, where a human rights violation committed by a law enforcement official does not amount to a criminal offence (e.g. failure to respect certain procedural safeguards), the law enforcement agency still needs to investigate the matter thoroughly and to ensure respect for the rights of victims regarding remedy and compensation. Judicial control over law enforcement action should cover all relevant areas: criminal prosecution and civil and public administrative proceedings for compensation or redress.

Victims must have access to judicial control. If that control is to be effective in upholding the rights of victims of human rights violations, independence, impartiality and objectivity of the judiciary are indispensable criteria. External oversight also includes national human rights institutions in charge of promoting and defending human rights. The structure and nature of such institutions may vary considerably from one State to another but they are all usually public bodies. Although they receive public funding, their independence and impartiality must be ensured. It is important for the public to be able to turn to such institutions in full trust and confidence as to their independence and willingness to protect human rights.

The two most common human rights institutions in the world are the national ombudsperson and the national human rights commission.

The national ombudsperson is usually tasked to receive complaints by individuals - but is sometimes also entitled to act on his or her incentive. After completion of the investigation, he or she is empowered to issue recommendations as to the response that authorities should give to the complainant or the affected person.

National human rights commissions are mandated to ensure that laws and regulations concerning the protection of human rights are effectively applied. Sometimes they are tasked to address specific human rights questions (e.g. discrimination). With regard to individual complaints, they usually function in a very similar manner to ombudspersons.

International mechanisms provide for additional oversight over law enforcement action. For instance, the International Criminal Court (ICC) is mandated to establish individual criminal accountability for the crime of genocide, crimes against humanity, war crimes and the crime of aggression. Crimes against humanity are the most relevant to law enforcement work; they are more precisely defined in Article 7 of the Rome Statute of the

ICC and include, for instance, acts of torture. There are two types of proceedings under which States can be held accountable with regard to their obligations under IHRL:

- Inter-State complaints: States can submit complaints about the failure of another State to honour its commitment under a specific human rights treaty to the committee in charge of monitoring implementation of and compliance with the treaty.
- Individual complaints: Where a treaty provides for the possibility of individual complaints - i.e. where individuals may complain about violations of their rights under the treaty - these are also dealt with by the relevant committee. Each human rights treaty defines the availability of and access to those mechanisms, as well as related competences and procedures within the scope of human rights issues covered by the treaty.

5. LAW ENFORCEMENT ORGANIZATION, CONCEPTS, AND GOVERNING PRINCIPLES

It is the State's responsibility to maintain law and order, peace and security within its territory. The structures set up by States for that purpose as well as the underlying law enforcement philosophies and concepts vary considerably across the world and it is unlikely that two identical systems exist. Whatever the choices made by States in this regard, they have to ensure that law enforcement is carried out in a way that respects the State's obligations under IHRL. This means that both domestic legislation and the practice adopted by law enforcement agencies must comply with the applicable provisions of IHRL.

The State's obligations encompass the duty to respect human rights; the duty to protect human rights; the duty to ensure and fulfil human rights; and the duty not to discriminate. As representatives of the State, law enforcement officials are expected to fulfil the above obligations when carrying out their responsibilities, i.e. to maintain public order, to prevent and detect crime and to provide aid and assistance in all kinds of emergencies. They are given specific powers to enable them to carry out their tasks: the power to use force and firearms, to arrest and detain, and to carry out searches or seizure. They must respect human rights when exercising that power, which means, in particular, observing four fundamental principles that should govern all State actions with a possible impact on human rights:

- Principle of legality: all action should be based on provisions of the law;
- Principle of necessity: it should not affect or restrict human rights more than is necessary;
- Principle of proportionality: it should not affect human rights in a way that is disproportionate to the aim;
- Principle of accountability: those carrying out the action should be fully accountable to all relevant levels (the judiciary, the public, the government and the internal chain of command).

Despite clear legal standards, law enforcement work is, however, not a mathematical science that leads to clear-cut answers. Because law enforcement officials have to deal with a wide range of situations with many conflicting interests, they are accorded a degree of discretion, which places considerable responsibility on them to make appropriate choices. The fact that law enforcement officials frequently find themselves in

stressful or dangerous situations and have to deal on a regular basis with people who have broken the law or are suspected of having done so means that high moral and ethical standards have to be met to ensure that law enforcement officials act in accordance with the law at all times.

Breaches of the law by law enforcement officials have a devastating effect on law enforcement work and ultimately on society as a whole. It is all too easy for "the end justifies the means" attitudes to be adopted in an environment in which serious crimes have been committed and where the difficulties of working in such an environment contribute to the development of group ethics and individual sets of standards. The leadership of law enforcement agencies therefore needs to be aware of the inherent risk of such group ethics fostering "grey policing" that may not always comply fully with the law. Commanding officers have to ensure that institutional ethics are formulated, promulgated and constantly upheld, thus clearly establishing full respect for the law as the fundamental standard to be met at all times.

In the difficult and dangerous working environment of law enforcement, it is not sufficient merely to set high ethical standards. Orders and procedures that clearly establish what is expected of the individual law enforcement official and their effective enforcement are indispensable to ensure that law enforcement work is always carried out in full compliance with the law.

6. PREVENTING AND DETECTING CRIME

Prevention and detection of crime is a key obligation of the State as part of its duty to protect the human rights of all who have become, or may become, the victims of a crime. At the same time, the exercise of powers by law enforcement officials investigating a crime may affect individuals' human rights. To effectively fulfil this obligation requires careful balancing of, on the one hand, the rights of the potential or actual victims as well as of society in general and, on the other hand, the rights of those who may be affected by law enforcement work. IHRL provides the legal framework for this balancing act. In particular, it sets out a number of guarantees and rights to be respected throughout the entire judicial process, starting from the very first stages of the investigation.

At the centre of these rights is the right to a fair trial, which is actually a set of rights that include the presumption of innocence, the right to be informed about the charges, the right to defence, legal counsel and unimpeded communication with the legal counsel, the right to be tried without undue delay, the right to an interpreter and the right not to be compelled to testify against oneself or to confess guilt.

Almost every investigation results in one way or another in an invasion of the individual's private sphere, affecting the right to privacy. Thus, as with any other interference in individuals' rights, such actions must be permissible under domestic law, necessary and in proportion to the legitimate objective to be achieved. Law enforcement officials are required to carry out the investigation with utmost objectivity and impartiality. The whole process must be free from any discriminatory reasoning or bias. Respect for the above-mentioned rules may occasionally encounter some resistance on the part of law enforcement officials, who may perceive them as inappropriate obstacles to efficient policing and as protecting "criminals." The commanding leadership of the law enforcement agency has the utmost responsibility for conveying a clear message to the contrary.

Only lawful policing is good policing; bending or violating laws, rules or regulations will, in the end, affect not only the judicial process but also the law

enforcement institution as a whole, including its acceptance and support among the people. To foster a culture of respect for the rule of law requires a set of measures to be taken at all levels - policies and procedures, education, training and equipment - as well as an effective system of sanctions to enforce respect for the rules and regulations. The investigative process itself needs to demonstrate a high degree of professionalism:

- Material evidence has to be collected thoroughly by competent law enforcement officials trained in forensics or supported by specialized personnel;
- Great care should be taken when interviewing witnesses so as not to obtain biased information;
- Proactive information gathered through the use of informants needs to be particularly controlled, preventing any tampering with the process; the same applies to the deployment of law enforcement officials as undercover agents, who should, in particular, abstain from any form of incitement to commit legal offences or crimes;
- Statements by suspects are a relevant source of information in the investigative process. However, law enforcement officials should avoid relying too heavily on them and attempt as far as possible to obtain objective evidence that helps to confirm (or otherwise) a suspect's statement;
- Interrogation of the suspect must be carried out in full respect of fundamental rights, in particular the presumption of innocence, the right not to be compelled to testify against oneself or to confess guilt;
- Torture and other forms of cruel, inhuman or degrading treatment are prohibited at all times. Such treatment has long-lasting adverse consequences for the victim, the perpetrator, the law enforcement agency as a whole, the justice system and society in general. No exceptional situations may justify a departure from this rule and that must be constantly affirmed by the commanding leadership of the law enforcement agency. The leadership must also take a range of measures to prevent torture from occurring, including a clearly regulated investigation and interrogation process, respect for judicial safeguards and allowing places of detention to be inspected by external bodies.
- Enforced disappearance and extrajudicial killings are among the most serious crimes and when they are committed, ordered or tolerated by State agents, they undermine the very foundation of the rule of law and of society. Every effort must be made to ensure the effective prevention of those crimes, which can only be achieved if the law enforcement agency is fully transparent and accountable.

An important element in the prevention of crime is the prevention of juvenile delinquency. A number of documents have been established to ensure that the justice system deals with young offenders or alleged young offenders in a way that takes account of their specific vulnerability and of their limited maturity and that prioritizes the prevention of future offences. The central document in this regard is the CRC, which defines a child in its Article 1. Additional rules are set out in the United Nations Standard Minimum Rules for the Administration of Juvenile Justice (Beijing Rules), a non-treaty document. When such persons have reached the minimum age established by domestic legislation for being considered responsible under criminal law, the concept of diversion (i.e. removal from criminal justice proceedings) is the approach recommended by the Committee on the Rights of the Child and in other soft law documents. This is based on the idea that youthful conduct which does not conform to overall social norms is part of the

maturation process and that a child-oriented approach involving all parts of society is more likely to prevent the child from embarking on a "career" as a criminal. For the same reason, the United Nations Standard Minimum Rules for Non-custodial Measures (Tokyo Rules) promote non-custodial measures.

Furthermore, it is recognized that juvenile offenders need special protection and treatment. Law enforcement officials involved in the administration of juvenile justice therefore need to be given appropriate specialized training.

7. CONCLUSION

For successful performance of the police work, police officers have the police powers established by the law and bylaws. The character of the police powers is such that allows the police officer in their official action to get deep in the area of some of the basic human rights and freedoms and as a consequence has their limit and even seizure.

Knowing the type and character of police powers is clear that in terms of human rights and fundamental freedoms is about powers that police officers, if they do not act with due and possible consideration in their implementation can easily prevent their abuse. Therefore, in their application, the police officer is obliged to act very professionally and humanely, procedure and manner within the legal provisions to respect the dignity, honor and reputation of the persons against whom acts as the fundamental rights and freedoms of man and citizen.

When undertaking police powers that have the effect of restriction or deprivation of liberty of movement, such as summoning, arrest and detention, the police officer is obliged to inform the person of the reasons why it takes such authorization and a language understood by the person to introduce the right to consult a lawyer or the right to remain silent, the right to counsel during the proceedings, the right to medical assistance when needed or when the person was calling, the right to be informed family member or a close person.

Law enforcement officials play a fundamental role in society in serving and protecting the people and in upholding the law. That role remains valid at all times – including in times of armed conflict and other situations of violence. This places a high level of responsibility on law enforcement officials, who are required to fulfil their duties in absolute respect of the applicable national and international law, however difficult and even dangerous the circumstances might be. This is far from an easy undertaking; the legal, ethical and professional requirements that have to be met are very demanding. However, compliance with international rules and standards establishes the indispensable framework enabling law enforcement officials to contribute effectively to peace, security and stability in society.

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TACTICAL MODEL TO BE USED BY POLICE UNITS DURING HIGH RISK POLICE OPERATIONS

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Abstract

The challenges and tendencies that appear in the process of contemporary and modern globalization and the dangerous types of organized crime activities impose the need for establishing a modern, efficient and adequately organized state security system that would face all security threats and challenges. Within the frames of the security system, the special police units play an important role because they perform the most complex and risky operations which protect the constitution and internal security of the country. In order to provide conditions for efficient and safe performance of the tasks which are part of police duty, every strategic, tactical and operative activity should be carefully and thoroughly planned. In order to find a solution to this complex problem, this paper elaborates a tactical model of use of the special police units during the process of planning, preparations and execution of high risk operations. In addition to elaborating the most important phases of high risk operations, the description of the tactical model also includes an analysis of a pattern of assessment of a particular case (event).

Key words: *special units, tactical model, high risk operation, case study analysis*

1. INTRODUCTION

The police, as well as its organizational units, play a particularly important role within the national security system, and especially significant is the role of the special police units which execute the most complex and risky operations.The challenges which these police units face are related to maintaining the independence, the territorial integrity and the Constitution of the country. More specifically, these challenges refer to everything that is called crucial security element of a country(Ристоска, 2010: 117-118). According to the legal regulations which regulate the work of the special police units (Law on Police, 2006), complete efficiency and flexibility should be provided with respect to the manner in which they function, which means that these units should be constantly prepared for further training activities, and, moreover, they should possess a high level of combat alertness (Ивановски, Јаневски, Недев, 2010: 298). The professionalism and skillfulness of the special units is a precondition for ensuring security which is achieved with the help of several strategic means and methods of action, which, when undertaken simultaneously, can lead to productive solutions for repressing negative security phenomena. The interest of the public sector includes establishing a unique police action strategy, and, within its frames, a Special Police Units Execution Strategy (Strategic Concept of the Ministry of Interior, 2016).There are several contemporary definitions of the special police units (Best, Feickert, 2009), but, in principle, every definition notes that the special police units are

specially organized, equipped and trained units and their basic role is to perform duties that are of great importance for the country's security. The basic features of these units, regardless of the type, assignment and affiliation include: there are only several such units; they have strategic and operative attributes; a headquarters is directly, or through specially established offices, in command of the units; the special units are directly associated to the security and intelligence department of the country; the members of the unit are selected based on strict and previously determined criteria; they are equipped with different standard and special weapons, fighting vehicles, helicopters, vessels and other specialized equipment; the training of the units is complex, versatile and time-consuming; the training, equipment and accommodation require huge material and financial investment.

Taking into consideration the elements that determine the complete functioning of the special police units, establishing a suitable methodology and action tactics during the execution of complex and high risk operations is a serious engagement which requires an exclusively professional approach during the planning of all activities on a strategic, operative and tactical level.

2. BASIC CHARACTERISTICS AND TYPES OF POLICE OPERATIONS

Nowadays, it is very difficult to define the term police operation, mostly because these operations are extremely complex and include more categories of activities that are performed by specially organized, equipped and trained police units. In general, a police operation is a collection of combat or non-combat activities, courses or other actions performed independently or in collaboration with other units, which aim to achieve different goals related to national security (Пена, Амиџић, 2007: 11). The general definition that shortly emphasizes the common features of police operations also provides a classification of these operations according to several different criteria (Милојевић, Јанковић, 2014: 23-24). In this context, the basic division of police operations is made based on:

- the goal that is achieved with the operation;
- the security levels during the operation's execution;
- the number of the units engaged in the operation;
- the most prevalent types of combat activities duringthe operation;
- the mode in which the combat activities are conducted during the operation.

Furthermore, the basic classification of police operations is divided into several subcategories of operations, which substantially reestablish themselves and are conducted as concepts and ideas within a previously established sequence of action in the performance of police duties.

The goal that should be achieved during the execution of police operations is directed towards the strategic level, followed by planning and conducting the operations on the operative and tactical level. Usually, the three types of operations form a totality that determines the sequence of organization and action of the police units.

Depending on the security situation, the police operations can be executed in peace, emergency and military situation. Regarding the forces which are engaged, the operations in which police units take part can be executed individually or by more joint units or formations. With reference to the dominating combat activities, the operations can be offensive (invasive) and defensive (protective). Regarding the mode in which the combat activities are executed, operations are divided in combat and non-combat. Combat

operations include multidimensional operations, such as: counter-terrorism, counter-rebellion, intelligence, preventive and logistic operations, while non-combat operations include psychological, informational and rescue operations.

All of the afore – stated police operations, regardless of their classification, are one entity with the goal to enable the police units to freely conduct and execute every tactical action, task, procedure and technique in different security conditions and situations.

3. HIGH RISK POLICE OPERATIONS

High risk police operations are most commonly defined as a complex of coordinates which are mutually related and share the same goal, tasks, place and time. They are considered to be special tactical actions, and are conducted by the special police units according to a previously established concept and plan (Станчев, 2004: 77). Due to their specificity and complexity, the high risk police operations are classified according to several criteria (Станчев, 2004: 78-88):

1. The type of facility and the goal of intervention. This type of classification includes detaining and arresting armed individuals and groups, removing barricades, releasing hostages and kidnapped people, preventing and obstructing mass civilian disobediences or protests, releasing illegally taken facilities, protecting and defending facilities in situations of crises or conflicts.

2. Basic tasks accomplished by the operation. Regarding the task accomplished by the operation, they can be: tactical operations, support operations, operations for distracting attention, intelligence operations, logistic operations, etc.

3. Level of hierarchy of the formational structures. Depending on the level of the organizational structures that take part (provost guards, departments, teams, groups), operations can be classified as common and specialized operations.

4. The time required to prepare the operation. With respect to the time needed to prepare the operation, there are two basic variations for preparing the operations: incidental (unplanned) and predictable (thoroughly planned).

5. The basic forms of tactical and operative activities. According to the form, we can distinguish between operation blockades, raids, purging operations, scrutinizing operations.

All of the above mentioned police operations, regardless of their classification are one totality and their main goal is to help the special police units to conduct uninterruptedly all tactical actions, tasks, procedures and techniques in different security conditions and environments (Klinger& Rojek, 2008), (Figure 1).

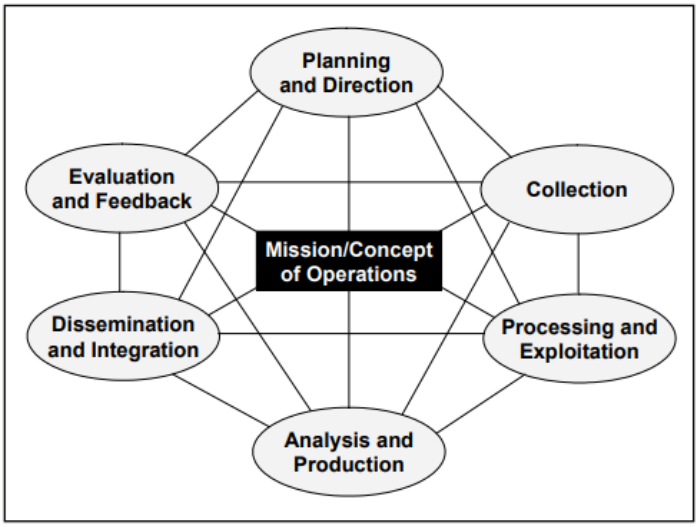

Figure 1: The process of conducting police operations

Taking into consideration the specific working environment of the special police units, we can conclude that each police operation is characterized by psychological and physical tension and uncertainty, as well as a real danger caused by the use of different explosive and incendiary materials and equipment, physical force, etc. These factors put into danger the lives and health of the special police unit's members, but also the lives of otherindividuals who have been the indirect goal of the action or people who have been there unintentionally (criminal and terrorist groups, hostages, locals, passers-by). As a result, high risk police operations are a complex security and tactical process which requires detailed planning, in order to provide conditions for efficient and uninterrupted performance of many duties which are a crucial part of the important phases of any police operation. In this regard, high risk police operations are composed of the following stages (Станчев, 2004: 78-88):

- **Investigation (collection of information about the operation);**
- **Preparing for the operation;**
- **Conducting the operation;**
- **Ending and analyzing (evaluating) the operation.**

The system of intelligence or investigation, as the first stage, analyzes the forces, equipment and the events that take place with the help of data collection and analysis of the location of the operation and other important elements of that particular case. More precisely, this system aims to obtain specific information, with the help of different intelligence methods: observation, telephone tapping, taking photographs, analyzing documents, interrogating detained accomplices, informative conversations with residents of a specific area, conducting demonstrative activities in order to check how the group would act or locating the criminal group, etc. All these investigation methods help to conduct proper systematization and evaluation of the information that would be properly used during the stages of preparing and conducting the operation.

Preparing for the operation, as the second stage, includes several groups of activities, which are conducted consecutively or simultaneously in cases when the time is very limited. According to this, the activities are divided in five groups:

- operation planning, and during this process the goals of the operation, its concepts, the decision making, creating solutions and drafting the plan for the operation are being defined;

- operation organization, which includes formation of the elements that would fight, assigning tasks to the teams (groups, units) and organizing the system of management and guidance;

- preparing the special forces and the equipment, which includes direct training and preparation of the leaders and their teams, equipping them with arms, etc.;

- distributing the forces and the equipment to the location where the operation will take place, which includes assigning specific tasks to the formational structures, establishing areas of responsibility, determining directions and routes of movement, using arms and other helpful equipment;

- examination of the assigned tasks and offering further support during the preparatory process.

Conducting the operation, as the next to last stage includes two parallel activities: managing (guiding) the units and tactical activities of the organizational units that participate in the operation. The managing during the operation enables continuous collection and analysis of information regarding the condition on the field, further explanation and making new decisions in case of sudden changes in the conditions of the previously made decisions, assigning the already given or new tasks to the tactical formations and maintaining constant communication between them. The tactical activities given to the members of the units are conducted in accordance with the tasks or the specific situation in the area of responsibility (tactical movement, blockade, detaining, incursion, search, negotiations, masking, observations, material, technical or medical support, etc.).

The last stage of the operation includes undertaking final activities such as examining and determining the condition of the unit's members, examining the equipment, weapons, vehicles, giving medical aid to the injured, evacuation, interrogation of the detained, writing official documents or forms, giving reports, etc.

4. CASE STUDY ANALYSIS OF THE USE OF POLICE UNITS DURING EXECUTION OF POLICE OPERATIONS

Case study analysis is a complex process focused on giving answers to a wide spectrum of questions important for the tactical concept of the use of units during the execution of a specific police operation (Ivanovski, 2013: 199-200). When a case study analysis is elaborated, a detailed analysis should be conducted in order to obtain as much information as possible regarding the crime and the suspects, and to determine the advantages and disadvantages of the unit's composition related to its existing structure and application of resources (Јакимов, 1999: 40-42). This means that the result which is expected from the analytic study is twofold: to create and establish a scheme that would evaluate the potential weaknesses of the goal and to evaluate the infrastructural composition of the unit. When a case study analysis is elaborated, four important elements should be taken into consideration(https://www.hsdl.org/?view&did=454231Antiterrorism force protection installation planning template. pdf):

- the sequence of events that have led to the crime;
- the crimeitself (the process of the crime and the post crime events);
- the response of the law enforcement unit to the crime;

– Current and past information about important lessons.

When information regarding the above mentioned elements is collected, it is extremely important to obtain indisputable and undeniable facts in order to establish a proactive approach and obtain an analytical product regarding the crime in question. As a result, it is necessary to answer lots of questions that stem from the detailed analysis of the essential elements. The analysis of the first element covers questions with respect to the group and individuals who take part in organizing the crime, their motives, intentions, personal contacts, previous offenses, criminal records, number, age, physical appearance, nationality, educational level, etc. The analysis of the second element covers questions that predict all possible activities and operations of the group during the event and after that. The analysis of the third element elaborates questions about the manner in which the unit operates as well as its tactical formations, it also elaborates specific tasks, determines the sequence of operating, establishes the communication and report mode, etc. The analysis of the fourth element obtains feedback information (answers) regarding the whole process, in other words, feedback about all security parameters related to the criminal activity itself.

Taking into consideration the four essential elements that enable the elaboration of a case study analysis, a scheme (graph) is presented, which evaluates the possible weaknesses and vulnerability of the unit during the preparation and execution of the police operations (table?). This weakness and vulnerability evaluation scheme is based on four basic factors:1. Possibility of penetrating the safe zone; 2. Injury and life loss risk; 3. Level of social disturbance and influenceand 4. Global threats trend level. The above mentioned factors, based on a six degree scale measure the level of threat and danger of the unit, during its execution of the combat activities.

Table 1. Weakness and vulnerability evaluation scheme of the police unit during execution of police operations

Possibility of penetrating the safe zone	**Injury and life loss risk**	**Social disturbance and influence**	**Global threats trend level**
0 –Impossible	**0 –** No potential	**0 –**None	**0 –**None
1 – Very unlikely	**1 –** Very low potential	**1 –** Minimal	**1 –** Minimal
2 – Unlikely	**2** – Low potential	**2** – Little	**2** – Some events in other areas
3 – Possible	**3** – Possible potential	**3** – Fairly	**3** – Possible
4 – Very likely	**4** – Significant potential	**4** – Significantly	**4** – Very possible
5 – Certain	**5** – Devastating potential	**5** – Devastating	**5** – Certain

5. CONCLUSION

The contemporary threats to security are a serious social challenge that should be addressed with the help of all defence mechanisms that are accessible within the security system. The police, as part of this system plays a crucial role in performing the security function, because the police units handle and face the most serious types of danger and criminal activities. The importance of the function of the special units, in regard to protecting the territorial integrity can be perceived in their combat readiness, training, and maximally professional approach during the planning of all activities on a strategic, operative and tactical level. It is known that the work of the special police units is constantly related to specific security demands and challenges, and in this context, establishing a suitable methodology and tactic of proceeding during the performance of the complex and high risk operations, is a serious obligation and a top priority of the country and the Ministry of Internal Affairs. This paper, by elaborating and presenting the tactical model of assignment and distribution of the special police units, attempts to optimize and standardize the approach to the execution of the most important stages of high risk police operations.

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COMMUNITY POLICING PROJECT IN THE REPUBLIC OF SERBIA[93]

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Abstract

A long-term strategy for the work of police in the community, namely the local community, is considered one of the key areas of work in the **Ministry of Interior of the Republic of Serbia**. Accordingly, with participation of representatives of the international community, a proposal for a plan for the development and implementation of the project *community policing* was drafted and promoted. The main goals of the program are training of the police and its officers for a new form of work, the priority of police prevention, better community relations (citizens) and the police, building standards in police work and improving the overall security situation in the community, in the function of a better quality of life.

Keywords: community policing, **Ministry of Interior of the Republic of Serbia,** police, organization

1. INTRODUCTION

The modern way of community policing as a new model of police organization was first applied in the United States in the early 1980s. In the countries of Western Europe it has been applied since the 1990s (Great Britain, Norway, Denmark, Sweden, the Netherlands, France, Germany), then some countries of Asia (Hong Kong, Japan), Canada and Australia. Since 2000, community policing has been active in the post-communist countries of eastern Europe which are in transition.[94]

It is increasingly recognized as the conceptual foundation that best suits the democrat police service. This approach is based on respect for human rights, accountability and the need for conducting effective police operations in partnership with communities for which the police service is public. Such a philosophy focuses on the community - the public - and its needs, as well as the fact that the police, in a responsible manner and through respect for human rights, serve the community.

[93] This paper is the result of the research on project: "Management of police organization in preventing and mitigating threats to security in the Republic of Serbia", which is financed and carried out by the Academy of Criminalistic and Police Studies, Belgrade - the cycle of scientific projects 2015 - 2019

[94] See: Simić, B., Contemporary Concept of police work in the framework of the community, *Security,* vol. 51, No. 3, 2009, p. 157 - 172

At the beginning of the new millennium, the Republic of Serbia also embarked on the transition and long-awaited social reforms, so the citizenship rights were given universal ideas about the necessity of democratizing society, building a modern state, and the rule of law. As a top-level goal and an absolute priority, our accession to the EU was highlighted. In the context of the "European Administrative Space", a reorganization of the state administration has begun with the aim of transforming public administration into a public service, which is a truly and modern "citizen service" identical to that of the EU countries.[95]

The police reform started *de facto* by separating the former State Security Service (RDB) from the Ministry of Internal Affairs of the Republic of Serbia and establishing the Security Information Agency (BIA) as a specialized agency (secret service) for the protection of the constitutional order. The remaining (majority) part of the **Ministry of the Interior of the Republic of Serbia**, the former Public Security Reform (RJB) and the accompanying logistics services, is programmatically shaped through an official document titled "A vision for Reform of the Ministry of Interior of the Republic of Serbia" according to which the most important goals of police transformation are depolitization, decriminalization, (pro-European) organization, the rule of law and others.[96]*De iure*, the reform of the Ministry of Interior of the Republic of Serbia was articulated through the Law on the Serbian Police, which emphasized the concept of organizing a civilian province, in the center of which is the Police Directorate. Within the Police Directorate, according to the hierarchical principle, there are lines of work (administration) and territorial organizational unit (PU Belgrade, PPU, PS - PI).[97]

The new model of the organization of the **Ministry of Interior of the Republic of Serbia** (Citizens Service) has also assumed a new mode of police work, and on the basis of a critical analysis of the previous traditional (repressive) system adopted as a pilot project the concept of community policing*).*

PRACTICAL IMPLEMENTATION OF THE CONCEPT OF COMMUNITY POLICING IN THE REPUBLIC OF SERBIA

As one of the key areas of work in the **Ministry of Interior of the Republic of Serbia**, a long-term strategy for the work of police in the community (the local community) is mentioned. Accordingly, with the participation of representatives of the international community, a proposal for a plan for development and implementation of the project "police in the community" was drafted and promoted.[98] The main goals of the project are the training of the police and its officers for a new form of work, the priority of police prevention, better community relations: citizens and the police, building standards in police work and improving the overall security situation in the community, in the function of a better quality of life.

It was suggested that the project "community policing" in the Republic of Serbia is initially developed into two phases: the first phase should be a pilot project and the second phase should be a project at the national level.

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[95] More: NikachZh., *Police in the Community*, IIIedition, Criminalistics and Police Academy, Belgrade, 2010

[96] See:*Vision and Mission*(2002),oficial document of the Ministry of Interiorof the Republic of Serbiaon the strategic directions of police development, Belgrade, Reports of R. Monk and J. Slater, reccommendations of OEBS and SE

[97] Law on Police of the Republic of Serbia,*Official Gazette*, No 101, 2005

[98]Vojnović M., Police in the community, *Security*, No. 3/04, 2004, p. 431 - 452

The first phase of the project "police in the community" in the Republic of Serbia was a pilot project "police in the local community". It was initiated in the middle of 2002 and started to be implemented in February 2003. The program was attended by local and foreign partners, and in particular experts from the Program for Security, Security and Access to Justice in the Balkans (SSAJP). The program was conceived and started under the auspices of the United Kingdom Department of International Development (DFID). At the beginning, four territorial units from different regions of the Republic of Serbia were included: Zvezdara (Belgrade), Novi Bečej, Kragujevac, and Vrnjacka Banja. The selection was made on the reasoned proposal of the Ministry of Internal Affairs of the Republic of Serbia, based on the opinion of the local self-government authorities and with the acceptance of other criteria (size of the territory, degree of industrialization, university facilities, tourist areas, etc.).

Within this phase, several activities (sub-phase) in the implementation of the project have been completed, so we will try to show the chronological one most importantly.Thus, in pilot municipalities, public opinion polls were first conducted, police and citizenship education was initiated, local security coordination bodies were established, program documents (strategies, action plans) and other were defined.[99]

Public opinion surveys were carried out by independent and expert agencies in these municipalities, primarily with the sociological method of interviewing and in general opinion freely. The results of the research, as well as the environments in which the research was carried out, were very heterogeneous, but they unambiguously pointed out the necessity of changes and the continuation of the reforms that were initiated.

The next step that was taken is the education of citizens and police officers in the form of numerous seminars, expert meetings, tribunes, lectures and other forms of education. The purpose of the education is to understand and accept the new model of organization and work of the police in the community. In this sub-phase, there are current workshops for educators and the conditions necessary for personal selection of candidates, and especially the preferences in the field of communication. Education is a permanent process that takes place in a specific environment, every day, without restriction and comprehensively.

Security Coordination Bodies are conceived locally, in the form of well-known Municipal Security Committees, and other names appear: Prevention Committees, Security Councils, etc. Representatives of local self-government, economic structures, judiciary bodies, police, schools, health centers, media, then prominent individuals, etc. are included in these bodies. Coordination bodies are formed in local communities based on decisions of municipal assemblies. These bodies or committees submit reports on work and receive suggestions, initiatives, opinions, etc. from them.[100]

Program documents (strategies, action plans, etc.) are the acts adopted at the level of local communities, which included primarily the priorities in the field of security in particular environments, concrete activities, tasks and measures of the authorized bodies, etc. The collection of knowledgeand information takes an important place, especially in the action plans of local authorities, and here special features of the police work, such as "open doors", offices (for youth, for the media, etc.), monitoring of the

[99] *Ibid.*

[100] In some municipalities, independent bodies (shadow committees) were formed as non-governmental organizations, with the task of criticizing the current state of security, measures and activities in the local community.

neighborhood, family, and others. After the initial knowledge, the analysis of information within specialized police lines (operational analysis), followed by the development of a proposal for an action plan for prevention in the local community. The Action Plan elaborates in details: community policing activities, stakeholders, the role of management in the development of police in the community, results, indicators of success, monitoring - monitoring of the realization, resources, time - deadlines for realization of activities, evaluation of police development in the community, impact activities to realize this strategy and anticipate and assess possible risks.[101]

Other activities include issues related to planners, executors, deadlines, funds, etc. In this part, the key is the staff (especially the leadership), coordinators in Police Stations, local teams and other participants.

The second phase of the central project "police in the community" in the Republic of Serbia is the project "community policing at the national level", which will be created continuously with the previous one as a result of good initial experiences at the local level. Based on this, it was estimated that it is appropriate to prepare the policy for the Community Policing Strategy at the national level.[102]

Based on the aforementioned experiences in the work of the local community, attitudes of doctrine and police-legal practice, the basic elements of the strategy of work at the national level are as follows: citizens' needs as a priority, problem-oriented policing, partnership, trust, responsibility. The important elements create conditions for police work and capacity building, both locally and nationally.

The stages in the implementation of the strategy are, as starting points, relatively similar to those of the pilot project "police in the local community". The following are stated: planning and building of programs, education of citizens and police, research of security problems and priority setting, decentralization, evaluation, etc.

When it comes to the implementation of the project "police in the community" at the national level, this issue has been preliminarily considered within the **Ministry of Interior of the Republic of Serbia** and two approaches were identified: gradual (selective) and progressive (intensive).[103]The first approach involves the development of the project gradually, while the other envisages simultaneous engagement in all police stations. According to previous experience, it is simpler to implement a gradual (first) solution, since there are fewer opportunities for possible mistakes, violations of rights, etc.

Given that human resources and material resources represent an important issue in the construction and implementation of the project "police in the community" as a whole, it is very important that a specialized Department for Prevention and Work of Police in the Community was established, within the Police Directorate of the Ministry of Interior of the Republic of Serbia. Identical departments were formed within the PU Police Directorate for the city of Belgrade.

Evaluation of the project and recommendations for further work

With the participation of authorized representatives of the RS Ministry of Interior, direct field operators, experts and international partners from the Department for International Development of the British Government (DFID), the Program for Security,

[101]Strategy of police in the community, Official Gazette of the Republic of Serbia, No. 55/05 and 71/05 – correction, 101/07, 65/08, 16/11, 68/12 – USand 72/12, p.10
[102]*Vision for a reform in the Ministry of Interior of the Republic of Serbia*, *Bezbednost*, 2003, p. 7–8
[103]Vojnović M., *Police in the community*, *Bezbednost*, No. 3/04, 2004

Security and Access to Justice in the Balkans (Balkan SSAJP) and others, evaluation of the project in 2004. The main goal of the evaluation was to check the results of the work in the past and especially the degree of implementation of the principle of "police in the community" in the Republic of Serbia.

The experts' opinion is that the initial organizational changes of the **Ministry of Interior of the Republic of Serbia** were effective and that the organization's novelties should continue. When it comes to educating citizens and police officers, it is necessary to continue with proactive content and take other measures to promote the new organization and the way the police work. In addition to good initial assessments and encouragement, problems with the implementation of the concept of "police in the community" have been pointed out in our country. It was also estimated that better police communication with citizens and local self-government bodies was achieved, which increased the confidence of citizens in the police and deepened the partnership at the strategic and local level.

The Joint Report on the Evaluation of the Community Police and Safe Community Project, on behalf of all participants, was submitted by the Ministry of Interior of the Republic of Serbia and the Department for International Development of the British Government (DFID). Regarding the systematics, it contains the following parts: introduction, work of the police in the local community, gained experience and recommendations, conclusions, gratitude, and attachments.[104] A particularly important part of the materials are recommendations aimed at improving the organization and methodology of police work in our country, so we will look at the suggestions and what has been done so far in practice.

The report concludes recommendations for improvements in the organization of the **Ministry of Interior of the Republic of Serbia** and the model of work under the concept of "police in the community" - a total of twenty recommendations. Because of the limitations of space, the character of the theme and other limits, we will point out only the most important elements from the current part of the document.

- Recommendation no. 1 - refers to the work of the police in the community, with an emphasis on the provision of services, as accepted style and manner of work of the police.
- Recommendation no. 2 - proposes to change the name of the project from the original "police in the community" to the more comprehensive - "community safety", which would better cover the territory of the Republic.
- Recommendation no. 3 - proposes to adopt and implement the new law on police and by-laws, protocols and memoranda, with the participation of other institutions (health, education, social work, and local self-government).
- Recommendation no. 4 - it is advisable to formulate a national strategy for community safety and to develop local action plans with specific objectives, methodology and deadlines.
- Recommendation no. 5 - suggests that preventive measures, especially in the context of domestic violence, juvenile delinquency and schools, should be included in the Community Safety Strategy.
- Recommendation no. 6 - provides that the directives for compliance are compatible with the Community Safety Strategy and the possibility of establishing internal control mechanisms.

[104]See: Melish D., Zoran Đ., *Results of the evaluation of the project of police in the local community and the security community in Serbia*.*Science, security, police*, vol. 9, No. 2–3, 2004, p. 215- 234

- Recommendation no. 7 - stipulates that the Department for Prevention and Work of the Police in the Local Community of the **Ministry of Interior of the Republic of Serbia**is the responsible entity for the implementation of the project and the coordination of activities.
- Recommendation no. 8 - identical departments for the work of police in the community at the PU level and the appointment of a coordinator for the same tasks at PS are envisaged.
- Recommendation no. 9 - envisages the development of a communication strategy with the aim of informing the community about the purpose and usefulness of the concept of community safety, the obligations of community representatives in the implementation of prevention activities and the involvement of Republic and local authorities, institutions, and the media.
- Recommendation no. 10 - provides for the development of a separate communication strategy for police officers in order to better understand the purpose and manner of implementation of community safety and to regularly inform them about developments, examples of good practice, and results.
- Recommendation no. 11 - provides for the development of a training strategy and a curriculum for improving the knowledge and skills of police officers and local community representatives involved in the project. It is envisaged that the level of training is tailored to individual needs, in accordance with the engagement, role and responsibility. The work of police in the community should be involved in all aspects of police training - for new students and specialization (departments).
- Recommendation no. 12 - envisages that in the training strategy, the issue of specialist training for police officers and members of the community is involved in addressing sensitive issues, such as: domestic violence, juvenile delinquency, drug addiction and other addictions.
- Recommendation no. 13 - provides for the design of appropriate training to improve the ability of workers in police units at the levels of PU, PS and the **Ministry of Interior**.
- Recommendation no. 14 - suggests that the functioning of the Security Council should be reviewed, especially from the point of view of expediency, schedule of work, membership, sessions, community support, accountability, etc.
- Recommendation no. 15 - provides for the establishment of a National Security Council with headquarters in Belgrade, with the representatives of the Ministry of Interior, the Ministry of State and Local Self-Government, the Ministry of Justice, the Ministry of Education, the Ministry of Health and the Ministry of Labor, Employment and Social Policy. This would provide strategic approach, work guidelines, partnership relations, defined measures for community safety, and crime prevention.
- Recommendation no. 16 - provides that in the territory of each municipality and in each PA a security body is formed, which would be a replica of the body described in the preceding paragraph.
- Recommendation no. 17 - suggests that publicity (citizenship) is consulted when defining local security issues and that public opinion is respected in terms of priorities, which would be identified through a multi-agency approach.
- Recommendation no. 18 - anticipates that an urgent review of the organizational structure of the police is carried out and that the service is restructured in the best

way, implementing the strategies (local and national), resolving the priorities in the work and by serving the service of citizens at the local level

- Recommendation no. 19 - refers to the education of senior police officers, so it is proposed to establish a program for the development of elders, leaders (existing and future) in the police, at the level of the ministry, administration and departments. It is estimated that this program would provide strategic development of the police organization and effective change management.
- Recommendation no. 20 - refers to the activities of international participants and redirect their support from pilot locations to the plans of the **Ministry of the Interior of the Republic of Serbia**, primarily to extend the project to a regional and national level.[105]

Most of these recommendations have been accepted and it was almost entirelyacted according to all suggestions. The most important moment is the adoption of the Law on Police and the Police Strategy in the community.

Changes were also made in the part of education of future police officers (SŠUP-COPO), employees (new programs, new rules on vocational training and training in the **Ministry of Interior**)[106] students of the Academy of Criminalistics and Police Studies (curriculum novelties) and in cooperation with other subjects (state structures, NGOs, international organizations). We believe that it is urgent to continue monitoring the implementation of the recommendations, so in due course, we may possibly carry out an additional evaluation.

2. CONCLUSION

The concept of community policing adopted in a developed world under the universal title of community policing highlighted, in the forefront, a novel approach to questions of the quality of life, community safety, and division of responsibility of subjects in the society. As a model of organization and work of the police in the contemporary society, the concept of community policing starts from a critical assessment of the traditional approach with the aim of creating a modern organization, meeting the needs of a democratic society and universal standards of the developed world.In the Republic of Serbia, community policing was adopted as a world model of organization and working methods of the police, which starts from the fact that the police is a public service serving the community, protects the interests of the society and its members and universal values such as human and minority rights, civil liberties, equality, coexistence in diversity (national groups and communities), development of ethical and cultural values, etc. The guiding principle is that the **Ministry of Interior of the Republic of Serbia** further develops itself as a modern organization equipped with modern means of work, has professional and responsible personnel who act in accordance with the law and ethical principles, on the basis of which the organization can respond to the demands of modern times.

[105]*Ibid.*
[106]Official Gazette of the Republic of Serbia, No. 80/2010

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THE CHALLENGES OF ETHICS IN THE POLICE OF THE REPUBLIC OF MACEDONIA

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In order to respond to public trust, the police must demonstrate professionalism and integrity by adhering to a code of professional ethics. Ethics dealing with moral issues in the profession of criminalistics or police is termed as police ethics. It includes a set of rules or criteria of morality of the profession of police work. The subject of this type of ethics includes all subjective aspects of morality and proposes to the police the norms and rules of conduct. Police ethics, inter alia, includes ethical codes, rules and written and unwritten standards of behavior and professional action. The purpose of this research paper is to provide a modern overview of some major ethical issues pertaining to contemporary Macedonian policing.The police have authorizations that can easily and quickly come to their misuse that can leave serious consequences to the person to whom they apply, as well as to the institution and profession they present. Police are supposed to be the ones who need to protect and serve people, but the biggest challenge is to do it with dignity.In this research 105 police officers (uniformed police) are involved, or about 10% of the total number of employees in the Sector of Ministry of Interior in Tetovo.Police officers act selectively in the enforcement of the law, and more alarmingly, most of them are not aware of police ethics. Also problematic are the violations of professional standards and the police code of ethics. Most police members fail to understand these standards and the ethics of their action.

Key words: *ethics, police, moral values, integrity, profession*

INTRODUCTION

Writing about professional ethics in the police is very difficult. When exercising its powers the police should be guided by the main principles of law and police ethics. It must comply with the Constitution and the Laws. The police must respect human rights. Police ethics is a collection of moral principles that police officers accept as part of their profession and their behavior in official actions within and outside the organization. In the Guidebook for Democratic Police by the Senior Police Advisor to the OSCE Secretary General, the section on police ethics and human rights states: In order to respond to public confidence, the police must abide by a code of professional ethics and demonstrate professionalism and integrity.

The notion of ethics means morality (habit, character, summaries of the permanent attributes of a person). Morality represents the form of human behavior or the practical relationship of a person to other people and to itself. Morality is the set of principles, norms and rules that have historically been created in certain socio-economic conditions and that determine the behavior of people in society, man's own behavior according to these principles, norms and rules. Morality is a rule, principle or norm of conduct, predetermined by a society, community, and accepted by a man for his manner of behavior and applicable to all reasonable people (Muhovic, 2006). Ethics dealing with moral issues in the profession of criminalistics or police is termed as criminalistics ethics or police ethics. It includes the entirety of the rules or criteria of the morality of the police profession. It proposes to the police the norms and rules of conduct and action. Therefore, police ethics, among other things, includes ethical codes, rules and criteria and written and unwritten norms of behavior and professional action. It has a duty to understand and explain the relationship between morality and social circumstances in which police acts (Muhovic, 2006).

Police ethics derives from the ethics of society, which is its first mirror. They remain inextricably linked to each other. Terrorism, drug smuggling, economic criminality, and all criminal acts constitute the planetary "disease" of today's society. The most competent and most deserving profile for combating these phenomena is that of the police. It is an irreplaceable protector of today's society and all its values, primarily human, people's rights and freedoms and dignity. The policeman's behavior and action are of particular importance. His behavior should be an example of the behavior and engagement of each member of society, which, unfortunately, does not happen that way.

His activity constitutes the foundation of society, its stability and all social values. Hence, it is not by chance that the police with its moral and professionalism is an obstacle to the moral and professional crisis of society and a barrier to the bribes and corruption of these dangerous diseases of the contemporary world. Therefore, the moral and professional decline of the police represents the breaking of the moral system of all other professions. For this reason, the moral and moral crisis of the police profession inevitably reflects in the crisis of morality of society as a whole and vice versa (Muhovic, 2006).

The ethical code of the profession of police must not be violated. The police officer should not take bribes and be corrupted, nor deal with drugs or prostitution, he must act according to the legal provisions that regulate their work. For violation of the rules he is subject to legal sanctions. The members of any association are not subject to legal penalties for violating ethical norms, but only to moral ones. On the other hand, it is difficult for the police to admit that they have violated the ethical rules of their profession, as is often the case with the members of associations. There are examples that show that the members of an association feel the blame they have made and are ashamed of their mistakes, which leads to apology to their association. They may apologize to the association they belong to and continue to be its members (Muhovic, 2006).

The police have special powers (including authorization for the use of force) to temporarily deprive people of their freedoms, to limit the full exercise of their rights (to stop, interrogate, hold, and arrested, confiscate property, take fingerprints and photographs, and carry out intimate bodily checks) and, in extreme circumstances, even use deadly force. Further, the police, in many cases, have the authority to decide whether or how to use these powers. In carrying out their duties, law enforcement officials should respect and protect human dignity and respect and guarantee fundamental human rights as well as civil and political rights (Roadmap, 2008).

1. SOME ASPECTS OF UNETHICAL POLICE BEHAVIOR

Any lack of knowledge, non-specialization, non-professionalism, lack of ethical dimension, dignity, etc., leaves the deepest traces in the police service. In addition, breaking the constitution, various types of misuse of powers, and other police deviations, especially corruption, adequately tells us with what seriousness modern society should consider these issues, especially in the examination of ethical behaviors.

The examples of unethical behavior lead us to the fact that only the ethno-professional and cooperative model with elements of tolerance and humanity, with moral values in the work of the police, guarantees the well-known universal values of dignity, transparency, democratization, trustworthiness, sound mind, legality, loyalty of the police system and its members (Ramo, 2008). This pluralism of ethical values provides a brilliant opportunity for it to lose the fierce name and character of a powerful state organ of militarized violence and closeness. It means that the correct placement of police ethics is an expression and confirmation of democratic policing (Cube, 1990).

2. SOME OF THE CURRENT CHALLENGES OF POLICE ETHICS IN THE REPUBLIC OF MACEDONIA

In the text below we will present some of the challenges faced by the Police of the Republic of Macedonia. These challenges will be associated with the data obtained from the survey of 105 police officers who expressed willingness to be interviewed for these sensitive issues. The research includes a survey of the Police officers of the Interior Sector Tetovo (comprising the Tetovo police station and the Gostivar police station). The survey included 105 police officers (uniformed police officers), or about 10% of the total number of employees in this Sector (Police Station-Tetovo and Police Station- Gostivar, also including road traffic units, intervention units, prevention unit, station cellars, etc.), 76 male and 29 female. The subject of research was the way of thinking and situations of unprofessional, unethical behavior of the police members who are in direct contact with the citizens. The research was conducted in July 2014 by authors and the respondents were police officers who were present at the workplace during the survey.

2.1 Lack of a flexible document that allows the representation of principles and good values

The police code of ethics should be treated as a "behavioral bible", rather than having just a descriptive character? Specifically, to give clear and enforceable instructions to the general principles such as integrity, transparency, etc. does any employee, or superior, have to lie, steal, subjugate, respectively? This attitude is based on the classic concept of

the term "ethics", which is mostly related to morality and values. More specifically, the value should guide us how to behave and act. Respect, responsibility, accountability, justice, transparency, good communication, etc. are considered as moral values. (Andoni, 2014). Decisions taken in violation of anti-ethical actions are issues that carry a high level of subjectivity and interpretation. Studies show that decision making in such complicated cases leads to strong reactions, facts or arguments, making the case almost insoluble (Miller, 2002).

Table no. 1 Reasons for unethical behavior of police officers.

	Nr	%
There is no legal regulation prohibiting it	54	19.21%
Lack of moral values	47	16.72%
Insufficient training	65	23.13%
It also appears in other institutions	32	11.38%
There is tolerance in the Ministry towards this behavior	38	13.52 %
They are not aware that what they do is wrong / impermissible	45	16.02%
Total	281	100 %

Source: Survey conducted with the police officers in SIA Tetovo

From the above data we see that the main reason we have unethical behavior of the police officers with the citizens is their insufficient training, as much as 23% or ¼ of the opinions are that unethical police behavior is due to insufficient training, whereas a second factor (19%) is that there is no legal regulation that prohibits such behaviour. This fact justifies the finding that police officers are not well acquainted with the general legal police regulation. It indicates that police officers need to be more involved in training for different forms for knowledge of the legal regulations that govern police work. Another reason for unethical police behavior is the lack of moral values and 16.7% account for the third factor why we have such a situation. Other factors include tolerance on the part of the Ministry leadership, unawareness of illegal actions.

2.2 Acceptance of the "code of silence" by police officers

It often happens that police officers in the absence of knowledge of the rules of conduct are subject to unwritten rules by producing the so-called "code of silence". Informally, the code of silence prohibits or discourages police officers from reporting their corrupt behavior to their supervisors. Such a code violates the creation of a good working culture of integrity in the police, which does not tolerate employees who abuse the rights and privileges offered by the profession. Specifically, denouncing corruption within the police ranks is at very low levels (Andoni, 2014).

Table no. 2 Reasons for not reporting a colleague for misuse of official assignment

	No
Fear of losing the job	59
It will affect / change my behavior with colleagues	47
I do not believe that appearance will affect / will have effect.	39
I would cover it as I wait for that and he would do the same for me	39
It is not my job	28
Total	212

Source: Survey conducted with the police officers in SIA Tetovo

The data in Table no 3 clearly shows that the majority of police officers indicate as the main factor for not reporting to their superiors any abuse of official duty is the fact that they do not have protection from the institution itself, namely the Ministry of Interior. Although most of the anonymous complaints to the Sector for Control of Internal Affairs and Professional Standards present accurate information on misuse by the leaders of the MIA, the cases are processed in the prosecution, but the final epilogue has been stalled. The second factor is the deterioration of relations with colleagues, because colleagues will not feel confident in their work with such a colleague. They indicate as a third reason the fact that there will be no effect and that such occurrence would also have an effect on protecting themselves in the future. A less opted for reason is that it is not their job, but of the bodies responsible for controlling their work. These data indicate that within the police itself there is a situation where police officers do not trust the institution where they work and that there is a duality of the rule of law, both for employees and for people outside it.

2.3 There is an inclusive oriented concept and continuous training

The practical knowledge of the principles and values, as well as their application in reality, are not static, they change. The Code of Ethics as an educational document should be accompanied by ongoing training during its use. The ethics-related issues themselves and their solutions differ, so reviewing the Code of Ethics, education and knowledge refreshment and ongoing training is a necessity. Continuous trainings besides the educational function increase the level of work culture within the institution (Andoni, 2014). In the current Code of Police of the Republic of Macedonia there are shortcomings with respect to the practical orientation with examples, in order to make it more understandable for the police officers, and to increase the level of good work culture in the institution. Employee involvement in training that allows discussions and interaction reinforces the knowledge of the Code of Ethics, increases the level of collective work culture, raises awareness of the values and principles and increases accountability to the public (Andoni, 2014). Currently, there is a lack of work culture as one of the causes that helps the corruption case in the police, whereas the lack of training is another important factor that promotes corruption in police structures.

Table No. 3 Denial of legal regulations is the main reason for non-transparent working in the MIA?

		I totally disagree	Not agree	Do not know	Completely agree
1	I am familiar with the ethical police code and the legal regulation in accordance with the performance of duties at work.	19	17	31	30
2	The police code of ethics helps me to perform my professional duties at work.	5	20	19	61
3	When I face the dilemma of ethics in carrying out my duties I know where to ask for help and advice	23	18	44	20
4	The training I receive from the Ministry of Interior for the code of ethics, human rights, integrity and other topics of everyday work are enough for successful performance of my job duties.	19	26	29	31

Source: Survey conducted with the police officers in SIA Tetovo

From the data we see that more than a third of the police officers are not familiar with the legal regulations and the police code of ethic, one third are familiar with it, while another third have no clear opinion. This is a very alarming situation because only one-third of the police officers are aware of their legal actions of various police authorizations that deeply encompass human rights. This indicates that police officers need training on the legal regulations and the police code of ethic. The reasons why we have such a situation are numerous, ranging from employment on an unfair basis, failure to meet the foreseen conditions, and the ongoing training as the legal changes and other regulations are made. This situation can be explained by the fact that nearly half of the respondents do not know where to turn to for work-related needs. Half of the respondents also think that their training is not adequate. Half of the respondents hold the opinion that police integrity is not promoted.

2.4 It limits the work of the controlling and monitoring mechanisms

The current code of ethics applies only to the police, leaving out interested third parties. It limits the work of the controlling mechanisms, whether internal (required periodic monitoring, or processing of information on the establishment of police reform strategies), or external (civil society, international monitoring organization, court etc.). The principles that avoid criminal activity and reduce punishments or dilemmas at the same time are not clearly reflected. Writing clear and practical principles enables the perfection of the mechanisms and facilitates the work of the controlling and monitoring structures.

Table No. 4 Meaning of the notion "Internal Control in MIA and Integrity"

Respect for the law	37	14.39%
Non-acceptance of corruption	41	15.95%
Possessing high moral values	26	10.12%
The imprisonment of a large number of criminals	21	8.17%
Respect for human rights	32	12.45%
Honesty	25	9.73%
To get the most out of the job duties	34	13.23%
Respectful behavior with all citizens	41	15.93%
Total	257	100 %

Source: Survey conducted with the police officers in SIA Tetovo

The data in the Table indicate that the majority of respondents have given the opinion that integrity means rejecting bribes and behaving with respect to citizens (approximately 16% of the answers), followed by respect for the law as the next most important element of this notion, and then respecting human rights and possessing moral values. Few respondents think that this notion includes imprisoning of criminals.Unethical behavior may occur when a police officer faces a conflict between a “norm” and a “value”. If, for example, a police sergeant driving an official car causes an accident and asks his young colleague sitting beside him not to report the accident, what is the younger police officer to do? Should they obey their superior according to the value of loyalty or should they denounce the sergeant, as required by the norm to report such incidents and the value of honesty? If the young officer decides to obey instead of denouncing the superior, they are behaving unethically by violating the values outlined in the code of conduct of the police service, while not necessarily breaching criminal law. In other words, they are not committing a crime, but the (in) action nevertheless can be defined as unethical. Corruption, crime and unethical behavior are often difficult to differentiate from each other, since there are overlaps and the definitions can be subjective – differing according to the circumstances. (DCAF, 2012).

Table No. 5 Actions of police officers when their colleagues violate the law on road traffic safety and not taking measures against them?

	Of course not	No	I don't know	Yes	Definitely Yes
Such conduct can be considered as non-compliance with the professional standards and code of ethics for police officers?	54	13	11	13	17
Do you believe that you can report a colleague who is involved in this behavior?	49	19		13	11
Do you believe that most police officers in your organizational unit will report a colleague involved in such behavior?	58	19	12	10	17
	Not	Rarely	None	Often	Too often
Do you believe that in your organizational unit there are similar or similar examples of behavior of police officers?	61	12	5	11	16
	Yes			No	
Have you ever witnessed such or similar behavior?	61			44	

Source: Survey conducted with the police officers in SIA Tetovo

Selective acting by police members is confirmed by the fact that 67 (64%) of the respondents stated that such an action does not count as disrespect of the professional standards and the ethical code of police members. Also, the data are nearly the same when it comes to whether a colleague is involved in such a situation and this is also confirmed by the answers to the question how many such examples exist in the respondent's unit. Additionally, these data are confirmed by the fact that most of the respondents (58%) have witnessed such cases. It does not mean that the lack of legal measures against their supervisors is a good act, because by law everyone should be punished without notice, the selection as in the above mentioned case means that citizens lose confidence in the police.

2.5 The text should be changed according to the current circumstances

Literature and good practices prove that the code of ethics should not be conceived as a text that is written in stone and is isolated from reality. The text should not be considered as static, but it should, over time, fit into the newly established conditions. The code should describe the current situation in which the police find themselves. The current police code of ethics dates from 2006. With a simple observation it is understood that more than 11 years have passed since it was written – making it non-current. The great changes that have been made in our society, the introduction of new police concepts, the entry into force of many legal changes and the adoption of new laws that were not part of the police practice

before requires the necessity of changing the current Code. The way of imposing discipline on police services should also change. Both society and the members of these organizations are willing to accept the traditional command and control approach to discipline.

2.6 The code of ethics reflects its descriptive character

Professional ethics helps to differentiate right from wrong at work, as well as be aware of the professional behavior in relation to colleagues, superiors and citizens who are affected by the services that the institutions where they work offer. The code of ethics should reflect as much reality as possible and not to be written as a text that simply copies and translates from similar documents, regardless of whether these are the most successfully applied models. The critics of the Code of Ethics are of the opinion that scripts without a practical sense are inanimate. Codes should be accompanied by examples of ethical behavior. More specifically, ethics in policing should not be just: Must, May, It Is Obligatory. Morality and ethics should be felt and applied in practice. Codes of ethics should be written in the practical format, which accompanies concrete examples of application of values and principles. This format is recommended to avoid some problems arising from the format in which the code of ethics is just descriptive (Andoni, 2014). The Code of Ethics describes or condemns actions, habits, or behaviors. The first question that may arise is the proper interpretation of actions, behaviors, or customs. If the codes are based only on the description of the principle, the reasoning in its violation remains based on interpretation issues that allow its abuse or in the best case deformation of the principle. To avoid deformations, explanatory examples of actions derived from the principle are important to help in the good application of the code (Andoni, 2014). The Code of Police Ethics of the Republic of Macedonia consists of 66 articles that have a fairly descriptive character (Code, 2007).

Conclusion

In exercising their duties, the police must demonstrate ethics, professionalism, and integrity, because they have special power to deprive citizens of freedom, limit their freedoms and rights, and in special circumstances, use force as well. Therefore, police officers should fulfill these duties in accordance with the universal standards on human rights and freedoms and political rights (UNICCPR, 1975). Legislation and regulations governing police duties and activity should be clear, accurate, and open to the public, because only then will close the possibility for the police to abuse and overcome their competencies, which will be the detrimental to human rights and freedoms (Neild, 2005).

Further education is also a priority. Building a police with ethics and integrity does not end up with basic education. The presence of corruption and its damaging consequences for the political, economic and police system, requires a doctrine and action strategy to be established which will contribute to greater resistance of the police and society in general.

Police officers are not well acquainted with the general police law and code of ethics. Unethical behavior with citizens is the result of their insufficient training. This indicates that police officers need training on legal regulations and the police code of ethics. The application of the "code of silence" violates and does not create a good working culture of integrity in the police, which does not tolerate employees who abuse the rights and privileges that the profession offers. Another fact is that selective acting by police members is not considered as disrespect of the professional standards and ethical code of

police members. Literature and good practices prove that the code of ethics should not be conceived as a text that is written in stone and is isolated from reality. The text should not be considered as static, but it should, over time, fit into newly established conditions.

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PERCEPTION OF POLICE - CITIZEN RELATION IN DIFFERENT HISTORICAL PERIODS IN THE WESTERN BALKANS

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Abstract

The area of the Western Balkans has been marked with big turbulences in different historical stadia. Certain historical periods in this area are characterized by historical circumstances that influenced the functionality of police and the relations between citizens and police. In this essay, we will try to show those relations in different historical and social periods. The aim of this work is to represent the characteristics of police system of the Kingdom of SHS / Kingdom of Yugoslavia, SFR Yugoslavia and the Republic of Srpska respectively, through the aspect of citizen-police interrelation. Without any pretensions to broaden this theme, which would require a publication of larger scope, we will point out to certain segments of the relation of police and society and the role of citizens in the security system in three completely different socio-political periods. The focus is set especially on the time modern police system of the Kingdom of Yugoslavia, modeled with quality and progressive legal and legislative solutions, but also burdened with problems in practice. Also, we will focus on the system of social self-protection during Socialist Yugoslavia and the concept of community policing applied in police in the Republic of Srpska.

***Key words**: police, citizens, perception, police system.*

1. INTRODUCTION

In different historical periods, the *police-citizen* relation depended on multiple factors and circumstances. In Western Balkans it was burdened with interreligious, international, cultural, and many other circumstances that shaped this interrelation. Certainly, this relation was influenced by the very evolution of society and the police organizations, and their functionality and way of work adjusted to current needs and time. It is also important to note that in the Western Balkans there were communities which not always considered the state apparatus as their own or even close but considered it imposed. Namely such relations caused numerous problems for police in their work, which influenced the relations of police and citizens. Also, police functioned in this area during different socio-political systems which shaped the police system and adjusted it to their needs. Earlier, unlike today, police were not facing the public opinion or giving attention to public relations, which also influenced on the relations between police and public. As

organization and functionality evolved, society evolved as well, and the police-citizen relation followed.

The level of development of these relations between the state apparatus and the citizens is considered one of the most important parameters of success and acceptance of any state institution in the social system, and police is no exception. The question of police-citizen relation is very complex as it is considered to be the consequence of specificities of police functions, functionality and model of organization. In order to enable police to achieve its function and aim, the state provided the scope of authorities and enabled the use of force. The state transferred the exclusive right of monopoly of the state power to police so it could act efficiently. That made police to be the element of the system that stands out the most and is by default brought in connection with the abuse of human rights and liberties. Naturally, such perception is the outcome of the historical role of the police as protector of the authorities from the inner enemy, the product of arbitrariness and overemphasized repressive behavior. Such state of facts is noted in the more recent history as well, which can be found in the examples of totalitarian regimes. The police-citizen relation has been changing in the past, but key changes happened after the French revolution. It is necessary however to distinguish the periods of police state and the lawful state. In a police state, the state leader has the so-called "police right" (ius politie) at his disposal. By police state we consider a specific political regime with several characteristics:

- Highhandedness of authorities, mirrored mostly in executing and managing institutions
- Government and police control of press and meetings
- The "system" of data tracking and monitoring and stalking of citizens for security purposes
- Expressed lacking of legislative rule power necessary for constitutional state, etc.[107]

In a police state, police is not limited by law, but by the so-called "state reason", and there are no mechanisms for control of its work which leads to arbitrariness and highhandedness of police, but also of the entire managing apparatus.[108] This inevitably leads to the abuse of human rights and liberties and eventually results in distrust of citizens with police and even fear from the police repression.

On the other hand, the main characteristic of a lawful state is mirrored in the principle of legislation. Legislations in a lawful state are tied to those they refer to as well as those who create them. Government and police are limited by law and on the regulations based on the law. Police is no more just a guardian of the state (or government structures) from the inner enemy, but the guardian of both state values and citizens equally. Certainly, that does not mean that there is no abuse of police authorities in lawful state, but citizens have many ways to protect their rights at their disposal. They may compensate the damage they suffered, unlike police state where they have no one to turn to.

Contrary to traditionally bad condition of the police-citizen relations, it is a fact that general functionality of police can hardly be efficient without the respect, support,

[107]Jovicic, D., *Organization and jurisdiction of the police*. Banja Luka:Faculty of Security and Protection, 2011., pp. 35.
[108]Jovicic, D., Setka, G.,*Organization and jurisdiction of the police*. Banja Luka:Faculty of Security and Protection, 2015, p. 37

cooperation and help of the citizens. This area of relations has a few mutually conditioned components where the following are the most important:

- Relation to citizens as the users of services and subjects of personal rights and liberties
- Relation to citizens as the subjects of a social control and cooperators of police in performing its main activities
- Relation to citizens as factors of the public opinion.[109]

An important segment of the police-citizen relations is definitely the active role of citizens as subjects of security system. Citizens should by nature be interested in their own safety which contributes to the safety of other people and the entire society. It means that security culture of citizens is extremely important in singular understanding of security significance and possible ways of achieving it. The least what is expected from citizens as subjects of security system and subjects of informal social control is to be cooperative with other subjects of security for the purpose of maintaining the satisfactory level of security in a community.[110]

2. PERIOD OF THE KINGDOM OF SHS / KINGDOM OF YUGOSLAVIA

The Kingdom of Serbs, Croats and Slovenes (SHS) was created in 1918, which led to forming the government where one of the ministries was the Ministry of Internal affairs.[111] The Royal Ministry of Internal Affairs was founded on 7th December 1918 by the Decree on education of the first Government of the Kingdom of SHS. The questions of organization and Ministry affairs were regulated by the Statute of Structuralizing of the Ministry of Internal Affairs in May 1919.[112] The Ministry was defined as the highest managing and supervising authority over all police organizations in the country. Reorganization came after the "6th January Dictatorship" in 1929.[113] By the Law of Internal Management (1929), the Ministry is characterized as the supreme authority for internal management. Most of the work in public security within the frame of this Ministry was done by gendarmerie.[114] The gendarmerie was formed in January 1919 for the purpose of "preserving the internal order" and per the Law on Gendarmerie[115] from 1930, it is defined as assisting corps of Royal Military of Yugoslavia and as a special unit with a mission to look after the public safety, maintain peace and order and enable law enforcement. Besides gendarmerie, the organization of police field work was based on the local organs of the Ministry – general managing authorities and local police stations. That brought gendarmes and local state and police officials in contact with the citizens. Because of the same reason,

[109]Milosavljevic, B., *Science about the police*.Belgrade: Police Academy,1997, p. 223

[110]Djukic, P.,The role of citizens in the Security system with a focus on security in the local communities. Scientifically expert Newsletter: Educator. Travnik: Faculty of Information Technology, 2017,p. 39-44

[111] Talijan, M.,Bozovic, B., The beginning and the initial period of the police service in Bosnia and Herzegovina,Newspaper ''Police, Security, Citizens'', Vol 1/05, Banja Luka, 2005,pp. 10.

[112]Decree on the Organization of the Ministry of the Interior, "Official Gazette of the Kingdom of Serbs, Croats and Slovenes", year I, 1919, No. 47.

[113]Law on Internal Administration, "Official Gazette of the Kingdom of Serbs, Croats and Slovenes", Year XI, 1929, No.143.;

Decree on the organization of the Ministry of the Interior, "Official Gazette of the Kingdom of Serbs, Croats and Slovenes", Year XI, 1929, No. 175.

[114]At that time, the Ministry of Internal Affairs covered most of the administrative departments, so-called. internal administration, and police affairs were only one segment.

[115]Law on the Gendarmerie, "Official Gazette of the Kingdom of Yugoslavia", Year XII, 1930, No. 235.

further on we will analyze certain regulations that referred to their work (mandate and duties) and all of that from the aspect of public relations.

Already the first Statute on Structuralizing of Ministry of Internal Affairs in 1919 brought a very laudable solution. However, while enumerating jobs from the jurisdiction of the Ministry, among others it was also stated they will look after the poor and troubled and supervise the public help and work of charity organizations and people collecting contributions. It is a very progressive regulation that is positive from the aspect of public relations, especially those on the margins of their community. Also, from the regulations of the Statute of Ministry in 1929, it is visible that certain activities in the aim of engaging citizens for preserving their own safety. The department of public force that existed in the Department of public security was focusing on cooperation of citizens in maintaining public security.

Further on, by analyzing the Law on state police officials[116] we can determine that its text is modern for the time and it is in accordance with the contemporary legal solutions that treat the legal area, duty and responsibility of police officials. Moreover, police officials had more obligations and bans (obligatory stay in military barracks for certain officials, ban on leaving the service location without approval, etc.). Per this law, the police official is obliged to provide help and protection to anyone whose life, body, freedom, or property is endangered, being on duty or not. On the other hand, which is definitely a deficiency, the use of force was not restrictively regulated like today. Regulations were very vague and imprecisely set, so they were leaving great options for police officers to use force and harm citizens. For example, the usage of knife, sabre, or even fire weapon was possible for breaking resistance that police officer encountered while performing *important* official acts or holding a suspicious fugitive on the state border. The lawmakers never actually defined these important official acts or suspicious persons. What is also found negative in relation to citizens is the power of police censorship. The police commissioners were authorized to perform supervision and giving permissions for organizing public productions[117], movies and theaters, concerts, music in bars, sport events, and censoring their programs and texts. Territorial commissioners of the time could have strong influence on liberty of theaters, movies or music expression within community, which today is impossible.

About gendarmerie, as far as discipline and personal relations were concerned, it was subjected to the Minister of Military and Navy (it was practically a part of the military). Gendarmes were therefore following military discipline by regulations. That is significant as they were the object of a very strict military-court control, which reflected in the behavior of gendarmes towards the service and the citizens and which in a way guaranteed their level of professionalism. Gendarme was obligated to provide help and protection to anyone whose life, body, freedom, or property is endangered, being on duty or not. Gendarmes and their superiors were given the duty to preserve dignity of their position, to treat everyone politely and to help out within their jurisdiction. In the context of behavior of gendarmes towards citizens it is important to note the Rules of service.[118] According to this rules, gendarmes were expected to be serious, decent and polite,

[116] Law on State Police Executives, "Official Gazette of the Kingdom of Yugoslavia", Year XII, 1930, No. 254.

[117] Decree on the organization and scope of the City Police Presidency, "Official Gazette of the Kingdom of Yugoslavia", Year XI, 1929, No. 243. and Decree on the organization and scope of the Police Administration, "Official Gazette of the Kingdom of Yugoslavia", Year XII, 1930, No. 62.

[118] Source: http://pescanik.net/zila-i-kundak-zandarmerija-na-jugu/, Access: 15.9.2017.

especially at meetings and festivities where they had to make sure to avoid any mindlessness, cruelty, or teasing. They had to address everyone with respect and others were obliged to treat them the same way, with the prohibition of public reprimand. Unless sent officially, gendarmes were prohibited from visiting inns and had to avoid places with "bad reputation" even off work. If the need would force them, gendarmes could ask for food in a private home, with the obligation to pay for it, and if a host would refuse money, they would need to leave the money to his children. In the Rules of Service, it was emphasized that efficiency of gendarmes is not measured by the number of written tickets, but the state of security in their area. Gendarmes were also doing many useful activities in the community such as following the work of inns and considering the guests' complaints, preventing gambling, controlling idlers or faces that can "harm or bore people", controlling treatment of animals ("dogs should not be provoked or hit") etc. All those regulations are telling us that gendarmes were expected to highly respect people and to protect their reputation, on and off duty. Citizens were supposed to treat the gendarmerie the same way. There were certain regulations that allowed gendarmes to ask for help from the "people that are present", "armed locals", etc. which made a good example of the partner relation between police and citizens. However, not everything was so positive and not all normative solutions were progressive for the time. Taking accused into custody is something gendarmes could do on their own, if the accused would be caught in act, disturbing public peace or without personal documents. During the arrest, if the accused would show resistance, gendarme would have to warn him three times ("Be still") and had the right to stab him in the leg afterwards. Gendarmes were suggested to use weaponry in "the widest sense" against armed troops. So the orders and regulations about the use of force were obviously unclear and imprecise.

In this historical period, the freedom of speech was jeopardized. It was in a way that public display of an individual could cause police repression. Gendarmes were obliged to report to the authorities anyone who talks badly about the government or criticize its orders and laws or make fun of the authorities with their writing or drawing, etc.

Although the legislation was quite good, it is necessary to say that the functionality of gendarmerie was not without issues. Due to the unified leadership for police and gendarmerie, it would happen that supervisors refuse to listen to not only local community leaders but also to the head of municipality, and low knowledge on the duties of gendarmerie would end up in conflicts with municipalities and their institutions. It would happen quite often that gendarme patrols due to the lack of staff would start conflicts with armed troops, so the guard would be strengthened. The biggest incidents that would ruin the reputation of gendarmerie would happen during chases after the runaway armed troops, and many severe crimes would remain unsolved since gendarmerie would be involved.[119] We can conclude that besides many good sides, gendarmerie was still the least popular among the citizens as its use of force was highly imprecisely formulated and gendarmes had very high liberty of deciding.

The police-citizen relation as well as the citizens' perception of police caused a serious problem of inherent differences among areas and separatist tendencies of certain areas in the Kingdom. The Kingdom was burdened by unsolved internal issues which led to the so-called "6th January Dictatorship" of king Aleksandar in 1929. At the time,

[119] Ibidem.

especially between 1929 and 1931, the police had extremely high powers.[120] Therefore, it is not difficult to conclude that the relation between police and citizens in that period was burdened with many issues that led to the negative perception of police among the citizens. Also, imprecise and generalized norms that lawmaker brought regarding use of force by the members of police certainly had negative influence on the police-citizen relation.

3. THE PERIOD OF SOCIALIST YUGOSLAVIA

After the Kingdom of Yugoslavia was occupied in the spring of 1941, the Ministry of Internal Affairs continued with work as a part of the Royal Government in Exile. During that time, officers of the law in the country were replaced with the occupation forces or worked under the occupation regime. In the later period, the partisan movement declined legitimacy to the authorities loyal to the monarchy and started to build their own system. Therefore, there is no continuity between the police in the Kingdom of Yugoslavia and the police in the Socialist Yugoslavia.[121] What happened was the complete change of socio-political, social, historical and other circumstances which influenced the relations between police and the citizens. A new police system was set, based on the closed model of police organization. The model of police organization in socialism is of high importance as the closed model of police does not require communication with citizens or building partner relations. Also, in socialism, the perception of police was that it is a force to be afraid of, not as a service to protect them.

In the organization and transformation of police in the Socialist Yugoslavia it is possible to distinguish a few phases that follow the constitutional changes from 1946, 1953, 1963, 1974 and the period between 1990 and 1992. Each of these phases brought certain changes in aspect of organization and defining assignments of the Internal Affairs.[122]

In the period since the end of the Second World War, until the constitutional changes in the late 1960s and the beginning of 1970s, the police apparatus was very much alike police state and had a lot of imperfections related to the revolutionary character of the new power. The socialist power perceived in maintaining and reaffirming its position and the needs of its consolidation. The internal affairs' organs were often acting in accordance with "the state reason" and orders of the Communist Party, and rarely following the law regulations and needs of the citizen's position. What was defended was the heritage of the revolution and the new power, without progressive means, without adequate professional experience and control of the judicial institutions.[123] The first Law on Internal Affairs was made in 1956 after the Law on People's Militia was abolished.

Worth of elaboration here is the so-called system of social self-protection which was proclaimed in the constitutional amendments between 1967 and 1971 and finalized in the 1974 Constitution. This concept was a good overture for new concepts of security and police action, e.g. in a community. Social self-protection, as a function of the political system of socialist self-management and the basis of its security is the assemblage of

[120] Law on Protection of Public Security and Order in the State, "Official Gazette of the Kingdom of Serbs, Croats and Slovenes", Year XI, 1929, No. 6. Gives extraordinary powers to the police in terms of controlling public outreach, political engagement etc.

[121] Šetka, G., *Impact on the organization of police structures in BiH in the security situation*. Banja Luka: Faculty of Security and Protection, 2015, pp. 112.

[122] Ibidem, pp. 115

[123] Ibidem, pp. 116.

measures and activities that are used by working class and citizens, basic and other organizations of associated work, local communities, self-managed communities and other organizations of self-management, socio-political and social organizations, associations of experts and other citizens, organs of the state and expert services for:

- protection of the constitutional order, i.e. socialist system based on the power of the working class and socialist self-management, brotherhood, unity, and equality of all our peoples and ethnic minorities, as well as all other parts of the heritage of socialist revolution,
- protection of social property,
- protection of self-managed right of working people and citizens, as well as other rights and liberties of persons and citizen,
- protection of personal and proprietary rights of working people and citizens,
- Freedom of social development including freedom of creativity,
- protection of public peace and order,
- Fire protection,
- protection of natural disasters and other sources of danger,
- protection of all types of socio-political appearances,
- protection and improvement of human environment.[124]

All the above stated proves that the aim of law regulations was to include a plethora of subjects in the functions of security, which is accepted by the current security concepts as well.[125] Citizens should naturally be interested in their own safety and be actively engaged in the process of its accomplishment. The system of social self-protection represents a conscious function of people which is planned and performed by measures and acts to prevent forces or appearances that latently or acutely jeopardize their lives, interests or vital values of community.[126] So what we discuss here is the associated work of citizens and their partnership with police in order to prevent jeopardizing security of community, whether those threats are socio-political or natural. The actual measures and acts of realization of the concept were predicted by the state laws, federal laws and sublegal regulations. Briefly, these measures were ideological, educational, informative (propaganda), social, organizational, normative, cultural and so on. They were mutually coordinated by citizens and all the institutions of the system, including police. As the main deficiency of this system we can identify the identification of its aims with the aims of state socialism. Every system of this kind needs to be separated from the politics of the power structures and needs to be directed towards the conventional sources of threats to security of every citizen. When it comes to the system of social self-protection in the Socialist Federal Republic of Yugoslavia, what was emphasized was "the protection of the heritage of socialist revolution and its goals", "the brotherhood and unity", etc, while the actual threats to the "regular" man and citizen were neglected.

In the whole, the security system in the former Yugoslavia had a lot of deficiencies and due to that, it was unsustainable. The deficiencies were inadequate and insufficient law regulations, inadequate share of police work and the share between the levels of state and federal units (socialist republics and autonomous provinces), but mostly

[124] Law on the Basis of Social Self-Protection, Nationalnewspapers, No. 29/86

[125] Đukić, B. and others, *Security aspects in local Communities in the Republic of Srpska*, Banja Luka: Faculty of Security and Protection, 2015, pp. 66.

[126] Simić, D., *Social and historical aspects of the System of Social Self-Protection*.Zagreb: Political Thought, pp. 482

the character of state socialism that fought its "internal enemies" with backward and unpopular instruments. Strict control of press and other media and the public standouts of citizens were in power. Citizens who would object the character of the authorities and would publicly step forward against it would be subjected to the rigorous measures of police repression. This was especially happening during the after-war period when the new power was affirming its position by mercilessly persecuting "the enemies of the state". The state of affairs improved in the late 1960s with the constitutional amendments and with the 1974 Constitution, when the concept of social self-protection was proclaimed.

4. CURRENT SITUATION IN THE REPUBLIC OF SRPSKA

The Ministry of Internal Affairs of the Republic of Srpska represents the unified organ of the management whose jurisdiction covers the entire territory of the Republic of Srpska. The police of the Republic of Srpska are doing the work of state management that refers to the protection from jeopardizing the constitutional order and the security of the Republic of Srpska, protection of life and personal safety of its citizens, as well as other law-regulated functions. Per the territorial principle, the police of the Republic of Srpska are organized in three levels: local, regional, and republic. In its work, the police of the Republic of Srpska are applying over 100 legal and sublegal acts.[127] The quality of legal and sublegal regulations referring to the police of the Republic of Srpska is something that does not ask for many words. They are normative acts whose content is in accordance with the international standards and the Constitution of the Republic of Srpska. The police of the Republic of Srpska is a modern police organization acting independently, impartially and strictly professionally. It developed strong mechanisms of control over police work, both internal and external (including Parliament, judiciary, Government and informal social control).

The relation of the police and the citizens in the Republic of Srpska is represented the best through the concept of community policing, recognized and fully implemented by the Ministry of Internal Affairs of the Republic of Srpska. Therefore, it is necessary to explain what exactly is the community policing and enumerate its most significant characteristics.

The community policing implies partnership between the police and the citizens where the partners act and work together in noticing and solving community problems. The complexity of the concept of community policing comes from the four basic dimensions:

- the philosophical dimension gives the widest instruction to the police work and incorporates the influence of citizens on police work modeled by the needs of local communities
- the strategic dimension builds in operative aspect and pushes the philosophy through action
- the tactical dimension translates the philosophy and strategy into the program
- the organizational dimension implies the changes in the police organization.

Besides the changes that are required for the entire social system, the success of the applied concept depends on the changes within the police organization. The strategy of

[127]Jovičić, D., Šetka, G., *Organization of the police system in Bosnia and Herzegovina.* Thematic conference proceedings of International significance, Volume III, Belgrade: Academy of Crminalistic and Police Studies, 2017, pp. 68.

community policing implies a comprehensive process of changes in the police and the Ministry of Internal Affairs. The goals of these changes are:

- Depoliticisation of police,
- Demilitarization of police,
- Professionalization of police,
- Improvement of economics in work.[128]

The starting activities of community policing in the Republic of Srpska are initiated in 2002 in cooperation with the members of International Police Task Force (IPTF), and the exchange of experience with police organizations from the developed countries of the world, cooperation with numerous international organizations, changes in the region and membership in many associations brought realization of these initiatives. Already in 2004 and 2005, following the European Union Police Mission (EUPM) initiative, the projects of community policing and encouraging capabilities of local police regarding safety of repatriates are realized. In the beginning of 2007, the Ministry started cooperation with the Swiss Agency for Development and cooperation (SDC) and jointly they achieved various education activities (seminars and workshops), exchanging experiences and organizing visits to Switzerland. After a few prevention campaigns, community policing became standard subject on the time High School of Internal Affairs and the Police Academy in Banja Luka. The Manual for the community policing in Bosnia and Herzegovina was made and four police facilities were renewed.[129] Numerous projects were started, among which the most significant were "School Police Officer" and "Days of Open Door", and all cities and municipalities in RS now have forums for the community security.

Following the conditions of local communities in the Republic of Srpska, the building of trust in the concept of community policing becomes even more important. It is a hardworking job, as many circumstances do not support this activity, and it requires time, patience and persistence to continue on that path. Police in local communities, especially in our conditions, must be recognizable for citizens and identified as a partner of citizens with the goal of creating a secure community and environment. Honest communication creates the relations of trust, recommendation and closeness within community, which makes the foundation for every upgrade of community policing. The sense of importance and belonging to the community homogenizes its structure, makes its members satisfied and all the destructive elements excluded in time to prevent consequences for the community as much as possible.[130]

It can be concluded that a lot has been done on the concept of community policing in the Republic of Srpska, especially on formation the project and attempt of approaching the citizens through meetings, forums and open offices. Also, a lot has been done for education, qualification and specialization of students, cadets and police officials in the area of community policing and realizing the need for partnership with citizens. What is still lacking is the adjustment of organization structure of police in order to proceed with the concept fully. Acceptance and will of key segments of authority and state is crucial for the success of this concept.[131]

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[128] Pena, U., *Community policing and its implementation with a special focus on Bosnia and Herzegovina*. Banja Luka: Police academy, 2006, pp. 156.
[129]http://www.mup.vladars.net/index.php?vijest=policija&vrsta=istorijat,Access : 29.9.2017.
[130] Đukić, B. and others, Ibidem, pp. 135 and 136.
[131]Ibidem.

When it comes to the citizens' perception of the Police of the Republic of Srpska, the most consistent is the research made under the project of the Faculty of Security and Protection, called "Perception of public on the state of security and trust in the subjects of security" (2013). Among others, the survey had the following question for the people in Republic of Srpska: "Which of the state institutions has the biggest influence on your sense of safety?" Almost 70% of respondents from the Republic of Srpska pointed out the police as the institution with the highest influence on the safety of the citizens' safety. It is beyond any doubt showing the positive perception of police by the citizens.

5. FINAL THOUGHTS

The police-citizen relation (and even the entire state management) is the question that needs to be treated with attention and is connected to realizing human rights and liberties. By comparing the three totally different socio-political periods regarding the police-citizen relation, we can conclude that each had its specifics, advantages, and shortcomings. However, we can definitely say that the evolution of society brought the evolution of police as well, which led to the evolution in the police-citizen relation.

The police apparatus of the Kingdom of SHS, later renamed to Kingdom of Yugoslavia, was very modern for the time. Practically, that country was the fruit of victory in the Second World War and was a respected member of the European family. The Kingdom gave a lot of attention to the promotion of the modern trends and values in Europe and the world, when it comes to the functionality of authorities, including police. In the largest part, quality and modeled law provided solid foundation for the professional behavior of police towards citizens. However, practice showed numerous problems in functionality. Citizens were not actually recognized as an active subject of the security system. Being a large country with heterogenic structure of population and under the influence of socio-historical circumstances, the citizens' perception of police varied in different parts of the Kingdom. Due to the censorship of certain social activities and wide spectrum of options of use of force, police was understood by citizens as the service for protecting the authorities.

Socialist Yugoslavia was the product of successful revolution of Communist Party of Yugoslavia, which after the victory in WWII took over the Yugoslavia. Naturally, the power was to be kept firm, which was unfortunately also police's duty. Police was the means in the hands of the Communist Party which was ruthlessly liquidated "people's enemies". After-war period was shaped with the lack of adequate normative acts, which was a step backwards comparing to the Kingdom period regarding the development of police and entire state, legal and social system. State of affairs shifted in the end of the 1960s and the first years of 1970s, when constitutional reforms promoted the system of social self-protection, which was recognized by the citizens as the preservation and improvement of their own safety. Perception of police in socialist times, up until the 1970s, was that it was a state institution of repression.

Finally, the end product of the historical evolution of police in this area is the Police of the Republic of Srpska, which represents modern police organization acting independently, impartially and strictly professionally. It was accredited by the UN Mission in 2002, which is recognition for the application of internationally recognized standards. Police of the Republic of Srpska applies over a hundred of legal and sublegal acts that are in accordance with the Constitution of the Republic of Srpska and the Constitution of Bosnia and Herzegovina. Also, the Republic of Srpska does a lot about the improvement of

the police-citizen relation and giving citizens the role of active subject in the system of security. The most significant role is given to the concept of community policing that implies the partnership between the police and citizens where partners act and work together on finding and solving problems within the community. The results of the scientific researches give credit to the positive perception of police in the Republic of Srpska. Also, the positive perception is influenced by the openness of the police for the public, dedicating attention to providing information in timely fashion, openness towards community and solving problems, as well as founding partnership with citizens.

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IMPLEMENTATION OF THE MODEL OF COMMUNITY POLICING IN FUNCTION OF TRANSPARENT, RESPONSIBLE AND EFFICIENT POLICE IN THE REPUBLIC OF MACEDONIA

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Abstract

This paper defines and analyzes the model of community policing, which the special crime prevention bodies of the United Nations, the Council of Europe and OSCE recommend to the developing countries or countries which face internal conflicts, in order to implement police service that would assist and cooperate in the process of establishing democratic society. In this context, this model of police work is already implemented by many countries in the world and gives different results in each country, depending on the specific conditions and needs. The Republic of Macedonia, with the support of its foreign partners, decided to implement a police service that would respect the human rights and freedoms, the rule of law and would provide freedom and security for the citizens and for the country's development. This paper presents the results from a study on the attitudes of the police officers responsible for crime prevention in regard to the application of police work analysis, which is the basic pillar for implementation of the model of community policing in our country.

Key words:policing, community, community policing, analysis

1. INTRODUCTION

Modern world has led to changes in the basic social structures, the institutional and organizational systems, as well as in the manner in which we perceive ourselves and the world around us. In this context, first and foremost we refer to the transformation of the logic of capitalism, the changes in the composition and the role of the country and its institutions, the speed in which the forms of social organization develop, the fluid identity sense and the changes in the daily exchange and interpretation of information by the media for interpersonal and mass communication.

The traditional stratification system is disintegrated, and the traditional moral and ethical values are less compulsory than they used to be. People are becoming more mobilized, which leads to the feeling of interconnectedness, but at the same time, lot of people feel unsafe and seek safety. Giddens[132]calls this diffuse insecurity and it brings on significant changes of the logic and practice of social control. The existence of fear and

[132] Giddens, A. (1991) Modernity and Self-Identity.во Martin Innes, Understanding social control Deviance, crime and social order, Open University Press,2003

insecurity is the basic stimulus for demanding better and more suitable control. The numerous forms of risk lead to a specific manner of considering the potential problems that need to be controlled by the country itself. It is evident that the risk is a very important element of the transformation of social control.[133]

A democratic country is obligated to organize, enable and equip its institutions, among which is the police, in a manner that would guarantee respect of human rights and freedoms. This need is constantly increasing, proportionally with the evolution of the human rights and freedoms.

The model of community policing offers the possibility of more extended cooperation between the citizens and the police, more efficiency of the police duties in detecting and preventing the crime, and due to the specific characteristics of the police work, it is especially important to implement and develop special procedures for intelligence analysis and the application and use of modern technologies. The police work should be constantly controlled, internally, as well as externally through governmental and judicial control, but also by the citizens.

2. DETERMINING THE CHARACTERISTICS OF THE COMMUNITY POLICING MODEL

At the beginning of the 1970s, numerous studies conducted in the USA showed that the citizens have expressed fear of crime and that the majority of them have been victimized, which negatively impacted the quality of their lives[134]. Solution was found in establishing partnership between the police and the citizens to solve issues related to crime, which led to the development of the community policing model.

Manning [135] gives this model several dimensions and applications, such as: ideological system (used to overcome the gap between the police and citizens), programmatic dimension (to assure citizens that the police is responsible and takes care of the common well-being) and pragmatic meaning (a program for crime prevention that also covers the citizens and intends to give more responsibilities to the citizens regarding security and crime issues, and change the organizational structure in order to achieve better coordination between the different levels of police hierarchy).

The term community is used to denote many manifestations and it has different meanings, which often leads to confusions. The concept of community has deep roots in the science of human society. The important sociological discussions about this concept in America aimed to put this question within the frames of the historical, political and sociological context of North America, by emphasizing to which extent the community has become 'a shadow', which was caused by the expansion of the megalopolises. The term community is most commonly used to stimulate public support, and is almost always related to positive ideas. Hence, the symbolic power of this term does not include any negative connotations. Criminologists started to use the term community in relation to studying the police, establishing complex relationship between two sociologically different

[133] Paul C. Stern and Harvey V. Fineberg, editors,(1996), Understanding Risk, Informing Decisions in a Democratic Society, NATIONAL ACADEMY PRESS, Washington, D.C.
[134] Wesley G. Skoganat al.(1999), On the Beat: Police and Community Problem Solving, Westview Press
[135]PetarK.Manning, (1989) Community policing, воR.G.Dunham, G.P.Alpert, Critical Issues in Policing, Contemporary readings, Waveland Press

subjects: the police which is a monolithic and professional group and the community which is a group with amorphous composition and structure[136].

Criminologists believe that merging the concepts of police and community is a type of a reaction to the bureaucratic police work, but also acknowledging that these subjects face the same problems, and the solution of those problems require joint efforts[137].

The model of community policing has four main dimensions: philosophical, strategic, programmatic and organizational[138]. Many theoreticians and practitioners point out that this is a new philosophy of performing police duties, which differs to a great extent from the previous models of policing.

The philosophical dimension[139]explains the central ideas and expectations arising from this model, and these are: understanding the broad functions of the police, participation of citizens in police affairs and different approaches in different environments.

Broad police functions. The model of community policing suggests wide insight in the police functioning, including those functions with no significance in regard to the control and law enforcement, such as: offering social services, assistance in tasks completed by other governmental and nongovernmental bodies, taking more responsibility in regard to protecting vulnerable social groups, minors, minority groups, poor people, homeless people, as well as people with special needs.[140]

*Participation of the community.*This model starts from the premise that in every democratic society the citizens must have free access to the work of the police organization and influence decision- making and creating the police policies. Local communities, even individuals, must be given the possibility to influence the manner in which the police officers perform their duties, and freely state their opinions and attitudes directly in front of the police officers. There are different ways in which citizens can be given more influence on the policing, but it is important that these ways show results, in other words, the police should seriously take into considerationthe suggestions and proposals of the citizens during the decision-making process which affects the specific community.

Different approaches. This model includes different policing strategies that would be correlated to the local traditions and values. This means that the police officers should get to know in details the community in which they work, in order to apply certain measures that will be accepted by the citizens and that will be close to their cultural values. Every local community is different, both in regard to important, as well as to minor issues (for example in some districts listening to loud music is not a problem for the citizens, and in other districts the citizens may frequently inform the police about this situation, and, if the police officers act bureaucratically regarding this issue, that would lead to dissatisfaction in the first case, and approval by the citizens in the second one). As a result

[136] Jayne Seagrave, (1996) Defining Community Policing, American Journal of Police, Vol. XV, No. 2 1996

[137]In the Sage Dictionary of Criminology, the community policing is defined as: a philosophy of policing that promotes strategies for solving problems of the community and reducing crime rates and the fear caused by crime and which aims to reestablish the trust between the police and the citizens with joint control on crime.

[138] Jenny Coquilhat, (2008), Community Policing: An International Literature Review,New Zealand Police, Crown Copyright

[139] Gary W. Cordner, (1995) Community Policing: Elements And Effects, Police Forum, Volume 5 Number 3, Alpha Enterprises.

[140]Robert C. Trojanowicz, (1990) Community Policing is not Police Community Relations ,FBI Law Enforcement Bulletin, 1990.

of that, this model is founded on legal and professional policing, adjusted to the traditions and values of the community in which the police officers work.

The strategic dimension determines the main operative concepts and it is a connection between the wider idea of the model and the specific program and practice that should be implemented. These concepts are: geographic focus, prevention and practical focus.

Geographic focus. This concept points out that the duties and responsibilities of the police officers should be geographically focused, which means that the police officer/s should cover a specific area, mostly small parts of urban districts, 24 hours. With this approach, after a certain period of time, the assigned patrol officer/s will get to know better the citizens who live on the territory they cover, establishing thus mutual trust and conditions for mutual collaboration. Furthermore, the police officer/s will become familiar with the local conditions and will be able to identify the problems in due time, and apply a suitable intervention to solve every conflict. Therefore, one of the crucial components of this strategy is to establish geographic responsibility from the rank of patrol officer, to the highest ranks in the police station, which would help them identify and in due time solve the problems in the community.

Prevention. The model of community policing should develop a strategy that will be proactively and preventively oriented. The police officers should analyze individual accidents in correlation with the conditions in which they occur, reappear and disappear. The preventive activities should focus on the security problems within the community, as well as on discovering the reasons, the conditions in which these problems appear, who or what causes the problems and the activities and measures which in cooperation with the citizens, will eliminate in the most efficient manner the problems of higher priority for the community.

Practical focus. The third element of the strategy is focused on the basic and most common problems in the community. According to this model of policing, the laws are a method of achieving important goals in life. More precisely, the goal of the police work is closely related to the social goods, such as protection of life and property, maintaining public order and human rights protection. The basic tool used by the police that helps them achieve these goals is the law and its enforcement, which should only be a method for achieving more important values, such as the social well-being. This type of distinction between the methods and goals is of huge importance in practice. It does not only remind us that the best police unit is not the one with most interventions, but the one that provides the best protection and security for the citizens.

The programmatic dimension implements the ideas and strategies into specific programs, tactics of conduct of duties and police officer behavior. The basic programmatic task during the implementation and bringing into practice of the community policing model is modifying traditional policing (regular patrolling, interventions and conduct of criminal investigations) by introducing crime prevention programs, regular contacts with the citizens, with non-governmental organizations related to security, schools, sport clubs, youth clubs, collaboration with other institutions such as social and medical services, focusing on the problems within the communities and implementing joint educational and control activities with specific groups and individual citizens[141].

[141]Marxist sociologists and criminologists (Christian, Gilroy и Sim, Hall, Scraton,) characterized Lord Scarman'sproposal from 1981 for implementing community policingin England, as an attempt of an authoritarian country to normalize paramilitary. They believe that the model of community

The partnership between the police and the citizens, the other public and private institutions that work on the territory of a particular community, and which can contribute to improving life quality is the starting point of this policing model. This model is present when the security programs for improving the public security are a product of more extended social partnership.[142]

Case after case, intervention after intervention, the police officers find themselves in a situation where the duty priorities and plans are determined by current turmoil and most frequently by unimportant criminal cases, in other words, the police tries to 'include' everything from the area of security, because it does not possess enough human and material resources. As a result of this, it is necessary to focus on solving problems within the community taking into consideration several stages: 1. Careful identification of the problem; 2. Analysis of the problem; 3. Search for more possible solutions; and 4. Reaction to the problem, implementation of specific measures and evaluation of the results that were achieved. Identifying and analyzing the problems are a starting point for achieving success.

Organizational dimension. This manner of policing will show results only if it is part of a new decentralized organization, if it develops in standard police procedure and if it includes all levels of the police organization hierarchy. Moreover, decisions should be made based on systematically collected and adequately analyzed information, as well as with the participation of other public institutions when necessary, and with more frequent involvement of the community (the crime and other security problems are not only tasks of the police), and in this way the community can take responsibility for their own security. The number of police officers who work in a certain geographical area should not be a result of an administrative decision, but it should be in accordance with the number of citizens living in that area, the security problems within the community and the needs of the citizens who live on that territory[143].

Despite the wide distribution and application of this model, and the attempts to implement it across the world, some criminologists point out that the 'community policing'is used by politicians in order to present a positive image of the police in front of the public, without taking into consideration its essence and without investing suitable resources for this concept. Furthermore, the popularity of this term is used to cover almost

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policingis the country's attempt, with the help of the police, to penetrate in the communities, not to provide more security for the community, but to have more control and to easily collect information about the citizens, as well as including other social organization in the policing, because the police lost its legitimacy.
More extended in Eugene McLaughlin, (2012) The New Policing, SAGE Publications Ltd.

[142] Jack R. Greene,(2000) Community Policing in America: Changing the Nature, Structure, and Function of the Police, in Policies, Processes, and Decisions of the Criminal Justice System, Criminal Justice 2000, Volume 3, U.S. Department of Justice.

[143]The number of police officers in certain police station was a subject of interest long time ago. In this context, John A. Fairlie, at the beginning of the XX century determined that the big urban districts have more police officers than the smaller towns or the rural areas. For example, in 1900 in New York there were 20, in London 24, in Berlin 25, and in Prague 30 police officers covering 10.000 citizens.
In John A. Fairlie,(1901),Police Administration, Political Science Quarterly, Vol. 16, No. 1 (Mar., 1901).

every innovation in policing, starting from the most ambitious ones, for which careful consideration is needed, to unimportant suggestions that serve for everyday political use[144].

2.2 IMPORTANCE OF THE ANALYSIS FOR SUCCESSFUL IMPLEMENTATION OF THE COMMUNITY POLICING MODEL

The analysis can be defined as a cognitive process that produces specific, detailed understanding of the criminal environment, as well as knowledge that helps solving problems under the jurisdiction of the police. If the police activities do not aim to identify the possible offender, all disadvantages in the police knowledge about the criminal activities and events will become apparent. The criminal intelligence analysis, in the last few years, has developed within the frames of the theoretic concept of risk society. The goal of the analysis is to develop better understanding of the risk, and how should this risk be managed, as well as to discover the necessary information that would fill the knowledge gaps. In order to accomplish these goals, the policing must be proactive and focused on achieving long term strategic goals, which requires suitable human and material resources.

The basic elements of the analysis are: decomposition, critical opinion, discovering connections, schemes, tendencies, anomalies, re-composition and synthesis. The decomposition is the first step of the analytic process which includes dividing the subject analysis into simpler components, attributes and features. The elements or components of a particular topic of interest are divided, analyzed and elaborated separately, and the goal is to discover activities, interactions, relations, transactions, specific behavior and connections between individuals and organizations that are of interest for the criminal analysis.[145]When the police discovers the afore-stated elements, they have a tactical advantage before the criminals. The goal of the decomposition is to obtain the necessary data and information, or to de-mask the scenario of the criminal activities that in future would be used as a reference to help compare the future results, in other words, to determine which aspects of the behavior of the individuals or groups change, and which aspects remain the same.

The analysis is conducted by critical reasoning, which is a mental effort to reflect deeply on a specific topic. People ponder, but it is deep in their existence (even among the most intelligent ones) to make mental mistakes. For these reasons, the analysis must include factors that will be discovered with help of evidence. First and foremost, the facts that we have at our disposal are selected, and those facts that are missing are hypothesized, and based on them, a plan for operative investigation is made, that would collect new information to prove the hypotheses true of false.

The analysis can be also defined as a systematic investigation of the crime and other deviant manifestations that are under the authority of the police, with the goal of reducing crime rates by undertaking suitable preventive measures. The analysis which is implemented in policing aims to discover the patterns of criminal behavior and the methods in which criminal activities are conducted by the offenders, to point out to the most common victims affected by the criminal behavior and to discover the meaning of the

[144] Lorie Fridell and Mary Ann Wycoff,(2004), Community Policing: The Past, Present, and Future, Police Executive Research Forum.

[145] Wayne Michael Hall, Gary Citrenbaum,(2010), Intelligence analysis: How to think in complex environments, Praeger security international.

space, place and time of committing the crime. When all this is identified and understood, the police will be able to establish the priorities of its work and to focus on the biggest risks on a local, regional and national level.

From the above mentioned, we can introduce a definition of an analysis which is needed in policing: *It is a systematic investigation of the criminal actions and other deviant manifestations with the help of information related to social, demographic, and factors including space and time, that help the police to perform its duties, prevent and discover crime and other illegal activities and to make an assessment about the future movement and actions of the criminal groups.*

The analysis uses quantitative and qualitative data[146]and methods.Quantitative data are used for conducting statistical analysis, while statistical methods such as frequency, rates, percents etc., are applied. Qualitative information is elaborated with qualitative methods which can help in discovering the hidden meaning of schemes and connections. Most often, the qualitative methods are applied in field research, such as observing the movements in specific locations in specific time and with the help of the methods for contents analysis used for analyzing police documents.

The analysis most often uses social and demographic data that are in fact the personal features of the individuals and criminal groups, such as age, gender, ethnicity, age, education, vocation, skills, financial status, monthly income, etc.These data, on individual level, are used to identify the offenders, and in wider contexts, these data help in determining the traits, capacities or weaknesses of the criminal groups. Furthermore, these data help to identify the individuals that are more likely to commit crimes, and to predict their future criminal activities.

According to the International Association of Law Enforcement Intelligence Analyst (IALEIA),the analytic process is composed of several subsequent stages[147]. According to Peterson[148], the analysis starts with collection of material and assessment of that material; organizing and classifying the data into a database; collecting further materials that are not directly related to the specific case; placing the data into a computer database according to individuals, groups, organizations, legal entities, etc., in other words, each entity should have 'biographic' data; establishing the connections between the entities and producing charts based on relationships, events, activities. The next step is to establish what necessary information for each entity or event is absent, drawing hypotheses, conclusions and recommendations for operative activities, and finally, preparing and presenting a document with recommendations to the management or to the operative employees.

[146]Police data include: words, numbers, images, video and audio recordings, signals, symbols and other information that is collected for observation or are a result of ideas. The data have specific value, in other words features according to which they can be measured and they refer to: individuals, organizations and systems.

[147] LawEnforcementAnalyticStandards, (2012),2nd edition, International Association of Law Enforcement Intelligence Analysts, Inc

[148]Marilyn B. Peterson,(2007), Developments in Law Enforcement Intelligence Analysis, во Improving the Law nforcement-Intelligence Community Relationship, National Defense Intelligence College,Washington, DC

3. STUDY ON THE CURRENT SITUATION IN REGARD TO THE APPLICATION OF THE ANALYSIS, CONDUCTED BY THE SECTOR OF INTERNAL AFFAIRS IN SKOPJE, BASED ON THE OPINIONS OF THE CRIME PREVENTION POLICE OFFICERS

The police officers, relying on their experience, in most of the cases know where the crime hotspots are located, as well as the individuals with criminal intentions on the territory in which they work, but the information obtained from the analysis can add new dimensions to their knowledge. However, police officers are noton duty 24 hours, and when they are on duty, they may discover information that is important for that particular moment. On the other hand, crime rates constantly change, new offenders appear, new crimes are committed, or are committed in a manner different from the already familiar one, and for these reasons, the analytic procedure is necessary for the police, so when the police officers perform their operative duties they dispose of useful, relevant and information received on time[149]. This is why criminal intelligence should be integral part of every police unit, and help police officers to perform their daily duties.

The Ministry of Internal Affairs of the Republic of Macedonia, together with the OSCE mission – Police Development Department, within the process of police reformation in 2002, started to implement the project 'Collaboration between the police and the community', in order to improve the cooperation with the local communities, the mayors and the municipality councils. Within the frames of the project, many seminars, trainings for police unit captains (chiefs of police offices and departments), trainings for police officers responsible for maintaining the public order and peace, preventing crime and traffic security took place until 2007. Furthermore, 52 police officers from all organizational units of the Ministry of Internal Affairs have been trained and educated with the goal to continuously conduct training sessions for their colleagues regarding the fundamentals and manners of performing their duties in the community. In addition, employees for contact with the public have been assigned to each police station. In order to institutionalize the project, changes in the organization of the Ministry have been applied, more precisely, prevention departments have been established in every territorial Sector of Internal Affairs, new work positions for crime prevention on a local level have been systematized, which was the starting point of establishing the community policing model. The goal is to maintain security, to conduct community policing training for police officers, to collaborate with other governmental bodies, institutions, legal entities and non-governmental institutions, to introduce the security problems, police regulations and activities to the citizens, to help in the development of consultation bodies composed of citizens from the local community, to include them in the process of finding solutions for specific security problems and to follow how police officers perform their duties and respect human rights and freedoms. The'Prevention Inspector Guidebook'[150]states that, in order to achieve good cooperation between the police and the citizens, it is obligatory to: 'collect and analyze information, monitor and observe what happens in the police and what happens in the community, the police management to support and encourage the police

[149] Scott A. Jefferys,(2007), Crime Analysis: Perceptions from the Field, Crime Analysis: Perceptions, Tiffin University.

[150]For more details page 55 from the'Prevention Inspector Guidebook' written in 2008 by OSCE and the Ministry of Internal Affairs (MVR), and, as we know, the only document that elaborates community policing in more details.

officers in regard to their inventions and creativity of performing the duties, constantly evaluate the results and effectiveness of the strategies, adjust these strategies and make them closer to the needs of the citizens'. An interesting fact to mention is that the Guidebook defines the problem as 'condition that is alarming, disadvantageous, menacing, causes fear or has the potential to cause confusions in the local community, mostly crimes committed in a familiar manner on a usual victim on already familiar geographic area,through a process of analyzing and implementing strategies for finding solutions or transforming an unwanted situation into a wanted one'. The crime problem is explained with the help of a crime triangle: victim/target, offender and place (location and conditions under which the crime was committed). In this context, we can notice the application of crime theories on routine activities and rational choice, which are not mentioned in the guidebook. We should point out that the guidebook, suggests the SARAmodel (Scanning, Analysis, Response and Assessment) for problem solving, which is a part of a policing model focused on the problems suggested by Goldstein[151]. The analysis is considered to be the core of the problem solution process, and it aims to determinewhich conditions or events preceded the problem, which events followed the problem, what are the consequences, how frequently the problem appears, how long it has been present in the community and to propose measures and activities for solution of the problem. The part focused on the police duty to educate the community is composed of some elementary information from the theory of situational crime prevention, without addressing it. Even though the guidebook applies only basic crime theories and scientific knowledge on crime analysis, it is an important step in modernizing police officer training.

The Law on Police[152], according to Article 11,regulates the work of the police in the community (even though it does not use the term community policing explicitly), and obligates the police to cooperate with the community, the citizen associations and other legal entities, as well as to collaborate with the municipal administration and the administration of the City of Skopje, in order to improve the security condition and detect criminal activities and other violations of the law. In order to develop cooperation and build trust and partnership between the police and the citizens, this Article also stipulates that the municipalities should develop joint coordinative bodies which would aim to promote better public security. Regarding the analysis in Article 15 which refers to the Public Security Bureau and Article 21, it is stipulated that the eight regional internal affairs sectors are responsible for planning, observing and analyzing the security condition with the help of collecting, elaborating, analyzing, using, evaluating, transferring, saving and deleting information, as well as elaborating personal data in accordance with the legal regulations.

As a result of the legal regulations, the new organization and systematization of the job functions in the Ministry of Internal Affairs and the training of a large number of police officers in 2007 and 2008 were promoted. Furthermore, the departments and the crime prevention inspector in every regional sector of internal affairs were also taken into consideration. In 2008, 80 employees of the Sector of Internal Affairs of Skopje were assigned as crime prevention inspectors. Few years after their assignment and after they

[151]Michael Scott, John Eck, Johannes Knutsson and Herman Goldstein,(2008), Problem-oriented policing and environmental criminology, во Richard Wortley, Lorraine Mazerolle, Environmental Criminology and Crime Analysis, Willan Publishing.
[152]Official Gazette of the Republic of Macedonia,No.114, from 03.11.2006.

were given preventive tasks, we decided to conduct a study[153]with a help of a questionnaire that contained questions about their attitudes toward the situation with crime, crime prevention and the analysis. This paper presents the results from the questionnaire related to criminal intelligence analysis.

Unlike the other parts of the questionnaire, the questions from the part referring to criminal analysis remained mostly unanswered by the respondents. The reasons for such attitude toward these questions could be only hypothesized, but certain indications that were received from the respondents who answered the questions show that the analysis does not function properly, and its results are not very familiar to most of the police officers. As a result, the information that was obtained from the questionnaire could not be completely analyzed, and it was impossible to make any generalized conclusion. Nevertheless, the hypothesis of the study was proven to be true, according to which the community policing model will be difficult to implement, due to the nonexistence of capacities for analytic work within the police.

The most interesting answers to the questions in the questionnaire include the following: only 10 % (7 from 70 respondents) of the police officers who took part in the survey have attended training for criminal intelligence analysis. According to the documents which the Department of Criminal Intelligence Analysis in the Ministry of Internal Affairs publishes once every three months, 10% of the respondents reviewed the crime conditions, 11% of the respondents used an analysis of the current crime trends, and most of them, or 17% of the respondents used the annual police work plan. The results from the work of the Department of Criminal Intelligence Analysis of the Ministry of Internal Affairs in Skopje were evaluated as good by 24% of the respondents, unsuccessful by 18%, while 57% of the respondents did not answer that question. The question: how often the Department of Criminal Intelligence Analysis delivers analytic data to other police departments in the Ministry of Internal Affairs in Skopje, was answered as follows: 18% of the respondents answered that it happens once every three months, 37% answered that it never happens, while 44% of the respondents did not answer this question at all. In addition, 12% of the respondents asked for information from the Department of Criminal Intelligence Analysis once every three months, 33% never asked for information, while 46% of the respondents did not answer this question. The question whether the criminal intelligence analysis is necessary for performing the police tasks and duties was answered as follows: 53% of the respondents think that it is extremely important, 55% emphasized its possible role in crime prevention and 54% of the respondents stated that the analysis can and should provide important and useful information for the efficient performance of police duties.

A common conclusion derived from this part of the research would be that heretofore the Department of Criminal Intelligence Analysis has little or no influence on the work of the police officers, mostly because the police officers have not attended proper training, and do not dispose of the necessary knowledge about the possibilities this analysis offers, and because the products of its work are not visible for the police officers, do not satisfy the needs of operative work and do not offer any new knowledge about the criminal

[153]This part presents the attitudes of the police officers regarding crime prevention in the Sector of Internal Affairs in Skopje (SVR Skopje)referring to the intelligence analysis and are part of the results obtained from the more extensive study conducted and published by: Stefanovska, Gogov, (2015), named as'The role of the police in crime prevention in Skopje' and it was approved and published by the Faculty of Security in Skopje. 70 police officers (from totally 80) responsible for crime prevention in Skopje took part in the study.

and security problems on the territory by collecting and analyzing information and data, and offering new solutions.

According to the answers, we can conclude that neglecting the intelligence analysis is a serious problem of the police officer training. As the training programs are prepared by the Ministry of Internal Affairs, this situation implies that even high ranked police representatives are not informed about the advantages of this analysis or believe that it is not very useful in performing the police duties.

For comparison reasons, we will use the results of the study on 'Community Policing' conducted in 2014 by the OSCE and the Ministry of Internal Affairs, in which 500 police officers took part.The question 'Are you skilled for community policing?' was answered as follows: 95% of the police officers answered affirmatively. Furthermore, 67% of the police officers answered affirmatively to the question 'Is the police professionally skilled?' 78.4% of the police officers answered affirmatively to the question: 'Are police officers professional and skilled in the performance of their duties?', which points out that the police officers are confident and know how to perform their duties, and making the performance of police duties even more successful, 90.4% believe that the number of police officers in the municipality they work in should be increased. The fact that the police officers are self-confident and believe in their capacities is an advantageous manifestation, but rejecting the analysis and the knowledge it produces points out to the attitude that 'to be a successful police officer one should be naturally gifted for that "to be a naturally born police officer"', which is very close to Lombroso's theory of 'natural born criminal'[154], which is nowadays part of the criminal heritage.

To rely only on the personal experience or on the experience of other police officers in the process of duties performance is not enough and it cannot adequately respond to the modern forms of crime. The attitude that crime will be reduced by increasing the number of police officers is widely distributed in other countries as well, where the reactive policing model is dominant. However, numerous studies conducted in the USA and Europe indicate that increasing the number of police officers has no influence on crime reduction, yet it has a negative impact on the government budget.

CONCLUSION

The modern types of crime are penetrating and are widely present in all aspects of society, seriously endangering human rights, as well as the legal institutions of the country. The country, in response to the crime, and in order to maintain its security, most frequently introduces intensive repressive measures, which, if not conducted in accordance with the legal regulations, become a serious threat to human rights and freedoms. The bigger the crime threat, the more serious the threat on human rights becomes, starting from the intrusive police methods and techniques for fighting against crime. As a result, legislation and practicing the legal regulations must make balance between security and human rights.

Therefore, the community policing model can be successful in detecting and preventing crime only if it is based on professional knowledge and a reasonable balance between the demands for greater security and the respect of human rights and freedoms. Respecting the rule of law in policing and detecting the criminal activities leads to stronger

[154]Đorđe Ignjatović,(2009), Teorije u kriminologiji, Dosije Studio, Beograd.

social and national democratic capacities, as well as to strengthening the cooperation between the citizens and the police. It will contribute to transparent and responsible policing and at the same time, this cooperation may result in greater efficiency in the process of building a safe society.

Human rights and freedoms are in function of the individual to freely create his personal identity in daily interaction with other people and the environment. Security is a precondition for the existence of a free and productive human being that can develop personal integrity and dignity, which, on the other hand, is a precondition for total development of the country.

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