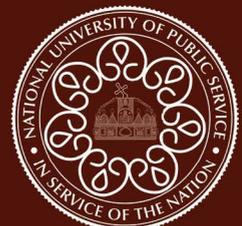Csaba A. BAKOS:
Warfare and Society

Péter RUZSONYI:
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Tamás SZÁDECZKY:
Security of E-Government Website Encryption
in Germany and Hungary

Warfare and Society[1]

Csaba A. BAKOS[2]

"War makes States and States make War."
Ronald Cohen

The purpose of this research paper is to provide a better understanding of the challenges that a modern state faces in the current security environment. Given the emerging threat environment with innovative state and non-state actors willing to confront a modern state across a spectrum of activities, it is of vital importance to provide a clear picture for civil servants/employees of the state to best use the tools of good governance. Without a more robust employment of the whole-of-government resources and a holistic approach of the national security the modern state will not be able to counter such threats and seize, retain or exploit the strategic initiative.

Keywords: *war, warfare, society, culture*

The absence of any superordinate authority or world government that would maintain order among states gives rise to a security problem with which all states must cope. Although survival is by no means one of the primary objectives states seek; and can best be achieved through utilizing the tools of *good governance,* [1: 1] the concern with national security is common to all. Security can be understood both as a defence against internal threats as well as the overall socio-economic well-being of a society and the individuals who compose it. While defence spending may contribute to security by deterring or dissuading would-be adversaries, certain economic benefits can be achieved, as well. Large allocations of a society's resources to defence may be attained at the cost of social or other programs that the state would otherwise be in a position to finance. Beyond these opportunity costs, defence expenditures that are excessive or wasteful of societal resources may even weaken the economy and reduce the economic and social well-being of the citizenry. Allocating more resources to defence may not even enhance security, rather, may induce other states to do likewise, in effect giving impetus to an arms race. Instead of enhancing security, such arms competition may set into motion a train of actions and reactions that undermines security for all parties concerned. Therefore, states are on their own to provide for their defence in a potentially hostile world. [2: 3–6]

The purpose of this research paper is to provide a better understanding of the challenges that a modern state faces in the current security environment. Given the emerging threat

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environment with innovative state and non-state actors willing to confront a modern state across a spectrum of sustained activities it is vital to provide a clear picture for civil servants/employees of the state to best use the tools of good governance. Without a more agile employment of the whole-of-government resources and a holistic approach of the national security the modern state will not be able to counter such threats and seize, retain or exploit the strategic initiative.

Background and the Operating Environment

Throughout the history of human civilization people relied on some sort of political organization in order to police the relationship between the freedom of the individual and collective needs. Since the Treaty of Westphalia delivered the birth of the modern state its *legitimacy* [3: 35] has been questioned and continues to be by many. Without legitimacy the modern state would have to use its coercive measures in order to maintain law and order in between respective boundaries. However, in a properly functioning state people may pay taxes, follow certain rules or even serve in the armed forces not because of the threat of punishment, but because they view such behaviour as the right thing to do. This world of modern states is built on a rational-legal foundation, which means that the bureaucracy including thousands of individuals is trusted to make daily decisions on a wide range of issues. However, it seems logical that in the future new forms of political organizations may displace states, just as it happened with city-states and empires. Challenges to the modern state may, as well, overwhelm it and will revert to warlordism, for example. Furthermore, technological innovation can make old forms of political centralization weak or even irrelevant. As a result, individuals may build their sovereign communities on a virtual domain rather than in the physical world. [3: 43–45]

The operating environment that has emerged since the Cold War has also demonstrated the intellectual and policy futility of the dogmatic understanding of warfare. The time of traditional understanding of military dominated, openly declared, force-on-force confrontation seems to belong to the past. Resurgent state adversaries, rising regional powers and non-state (both global such as NATO and sub-state like insurgent groups) armed organizations are seeking to dominate the political, military and ideological arenas of both peace and war. Some of the most visible form of the short-of-war type warfare practices are the Chinese Unrestricted, the US Political, the Iranian Asymmetric, and the Russian Hybrid Warfare to name a few. They share a common idea that can be best described as Unconventional Warfare. This indirect approach of military actions combined with non-military measures can level off or neutralize the enemy's technological superiority in order to obtain political-economic benefits without traditional armed struggle. In other words, in these kinds of operations the main effort is to combine political, economic and information campaigns in order to influence government policies of adversaries through psychological operations that target the respective human population. [4: 4–7] Therefore, the targeted state may lose its legitimacy.

Strategic Culture

For one who should choose to study the connection between warfare and society, the theory of strategic culture can be one of the most interesting fields. [5: 113–116] Given the difficulties of understanding cultures stems from the fact that culture is difficult to define, and it has been the subject of intense debate to date. However, the ways in which societies identify themselves can be important for political implications. Ethnicity, nationality and citizenship provide collective identities with relative clear boundaries for people to understand the nature of freedom and equality among different actors of human relations. These differences create conflict, competition and also cooperation for the exercising power and authority in society. Therefore, studying these differences can help to understand how societal differences profoundly shape politics within countries. Finally, all these forms of identification set the arena for political struggle over the very freedom and equality. [3: 71]

Political Culture

If a society is a complex collection of people bound by shared institutions, then culture compromises those basic institutions that help to define a society. Furthermore, culture helps people to understand what is and what is not acceptable and provides guidelines and priorities for organizing life; therefore, it can differ significantly in their attitudes toward leisure, privacy and politics. Culture stands somewhere between the group identities of ethnicity, national identity and citizenship on the one hand and individual political attitudes and ideologies on the other. Culture binds groups together, serving as part of the fundamental content of society, at the same time it is a personal set of norms that people may choose to accept or reject to varying degrees. In short, culture is the activity that a group considers proper and normal for its members. Thus, political culture refers specifically to the fundamental norms for political activity in society. According to Inglehart societies can be arrayed by the way they are guided by values. Society's role in politics is clearly complicated, shaped by many factors that affect the ongoing debate over freedom and equality; however, collective identities are more resilient than once thought and they may in fact sharpen in the face of new societal challenges. More broadly, politics is not simply the sum of individual actions but the product of rich collections of institutions that overlap one another, providing meaning to life and informing the ideas, viewpoints and values. [3: 72–75] Recent anthropological research also found more continuity than discontinuity among different forms of state and warfare and these records show that mankind is warlike and have always been such. Wars of today are seen to be more violent not because the human population of the globe is more aggressive than before, but because it became highly effective in anything it does. [6: 176–192] [7: 67–78]

Strategic Culture and National Style

Clausewitz argued that three important elements come into play in any war: the government, which sets the objectives for the war; the armies, which fight it; and the peoples who support it. Clausewitz stressed that leaders should also not forget the real potential of a mobilized

mass society. In some ways it challenges the unitary rational actor assumption in security policy studies, based on the conviction that domestic political conditions could shape even the grand strategy that elites (leaders of political parties, economy and the armed forces) articulate in a unique strategic culture related to the security and military affairs. Other important elements of strategic culture include the context associated with perceived security threats and technological development; strong cognitive content associated with attitudes and beliefs; historical legacies; and beliefs about the role of military and concerned institutions in the policymaking process. [8: 93–95] Generations of scholars have produced greater understanding of ties between culture and state behaviour. Strategic cultural studies have provided rich descriptions of particularistic cultures and identities, and researchers have acknowledged important links between external and internal determinants of national security policy. After decades of scholarship on cultural determinants, the theory of strategic culture is on its way to become an accepted independent variable in casual modelling. If so, strategic culture becomes a generator of preferences, a vehicle for the perpetuation of values and preferences. Strategic culture includes the beliefs and assumptions that frame choices about international military behaviour, particularly those concerning decisions to go to war as well as preferences for offensive, or defensive modes of warfare, and the levels of acceptable wartime casualties and the collateral damage. Most scholars agree that elites of a society are instrumental in defining security policy goals and the direction of policy restructuring in case of new challenges. Contemporary scholarship contends that elite behaviour may be more consistent with the assertion that leaders are strategic *users of culture* who *redefine the limits of the possible* in key security policy discourses. Therefore, strategic culture is best understood as a negotiated reality among security policy elites. While leaders clearly pay respect to deeply held convictions associated with strategic culture, the story of security policy development may be best understood as the pursuit of legitimation for preferred policy courses that may, or may not, conform to traditional cultural boundaries. [8: 103–110]

Military Culture

Examination of the European military history makes it clear that the warfare of different ages was largely determined by the specific societal, economic, military and cultural differences between belligerents. Recognizing this led to the first steps of the theory of military culture. Today, this theory is an integral part of the Hungarian military science and officer education marked with the name of Jenő Kovács, the late superintendent of the Zrínyi Miklós Military Academy. To test his theory, as an independent concept, does not require the complete overview of several thousand years of European military history. It is enough to look at the events of the period of Napoleonic wars from 1789 to 1815. Kovács, following Clausewitz's detailed scholarly work on victory proposed to divide militaries by their approach (direct—manoeuvre centric or indirect—attrition and guerrilla) to wage war. [9] The dynamic changes of the 1990s resulted that scholars of the Hungarian military science were facing serious challenges. It became clear that the former balance-of-power-based strategic thinking would need serious reconsideration. In order to develop a new National Military Strategy, Kovács proposed a holistic research

approach of the subject inviting scholars of various disciplines such as geopolitics, history and representatives of international relations. Kovács primarily supported his initial idea with the works of Anglo–Saxon authors on strategic culture and came to the conclusion that, in addition to decisive use of armed forces, there are ways to successfully conclude an armed conflict such as psychological warfare, ideological warfare and economic embargos. Kovács's untimely death did not allow him to complete the research; therefore, the concept of military culture is incomplete. However, it is providing a sufficient basis for contemporary researchers and military professional to further explore the topic. [10]

Annihilation

The strategy of annihilation is based on the idea that a single event or a short series of directly related events can produce victory. Thus, this can produce victory by primarily eliminating the enemy's physical capability to defend; therefore, it requires such forms of mobility that make forces able to move to positions of advantage from where they can defeat enemy formations by concentrated fire. Orchestrating manoeuvres of fire and fast-moving echelons of combined arms requires timely and trustable information because of the nature of ground battle. Namely, this kind of battle is chaos on a grand scale. Commanders are to keep the enemy in this chaos, while operating with some sense of order and cohesion on their own sides. This competition is subject to the fortunes of war; therefore, commanders are trying to give the enemy more problems to solve in a given time frame than he and his organization can possibly handle. It requires not just outmanoeuvring the enemy, but also outthinking him. Once one has been run out of options, he is forced to fight the other on the other's term, and then he can be physically defeated or destroyed. [11: 135–136] Kovács also named this approach manoeuvre centric military culture.

Attrition

Attrition or exhaustion is the continuous wearing down of a nation's capability to resist. According to Clausewitz: *Inability to carry on the struggle can, in practice, be replaced by two other grounds for making peace: the first is the improbability of victory; the second is its unacceptable cost.* [12: 33]

Modern practitioners generally use the terms attrition and exhaustion interchangeably; however, they refer to different aspects of the same strategic concept. The earlier tends to be associated with the improbability of victory, while exhaustion refers to a victory of unacceptable cost. A combatant using a physical attrition strategy intends to win by destroying the enemy's military forces over time. The primary intent is for the enemy to realize that it cannot win and will continue to suffer casualties; it surrenders based on lack of hope. Alternatively, the enemy military is so severely depleted over time that it eventually is incapable of defending itself and is destroyed, leaving exactly the same strategic outcome as an annihilation victory. [13: 9–10]

Exhaustion or Guerrilla Warfare

The common explanation of insurgency strategy is that it pursues exhaustion because resource limitations prevent a more nuanced approach. Exhaustion strategies need not be extremely massive, complex, or synchronized. This strategy mainly differ from other strategies in that its aim is to erode will over time to convince the target audience that further resistance is fruitless and will only result in more casualties. This special kind of moral attrition may target policy-makers, elites, or populations. Ideally, the enemy surrenders before his entire force, economy, or society has been destroyed. Moral attrition campaigns can also be conducted using information operations as the major (even sole) component of the strategy. Propaganda convinces the enemy that resistance is futile, and the future following surrender will be better than can be achieved otherwise. [18: 13–14]

Changes in the Civil–Military Context

The issues became more focused after 9/11, since a new kind of war, the *global war on terror (GWOT)* has been introduced in which the overriding concern became security against radical non-state actors who threaten the world with using weapons of mass destruction. This new war included a number of *small war* missions familiar from the past and some new ones as well, but all required the transformation of a military that had been created in the Cold War for battles in Europe against the massed armoured divisions of belligerent forces. In this new environment, the military's firepower became an instrument of last rather than first resort. [14: 26] Scholars have given a variety of names to these missions including *asymmetric warfare, counterinsurgency, fourth generation war,* but they share a common denominator: *success requires the application of extensive and well developed political skill of the armed forces.* Clausewitz's dictum certainly has a special application in today's conflict environments essential to success and involves the operational forces and their leaders in extensive political interaction. Today's security environment is an environment of coalitions. Most of the wars fought in the twentieth and twenty-first centuries have been waged with allies. The requirement to conduct operations under the umbrella of the United Nations or as a member of the North Atlantic Treaty Organization or European Union indicates that this reality will not change in the near future. It forces the military to forge a unity of effort with coalition partners rather than the unity of command preferred by all military leaders. However, this is difficult to achieve. Differing military and social cultures, languages, and home constituencies often involve military leaders in difficult interactions with their international counterparts to maintain the strategic, operational, and tactical direction. These efforts are fundamentally political, and local misunderstandings can endanger mission accomplishment as well as the relationship among partner nations. These realities were highlighted during recent counterinsurgency operations, where the U.S. command dictated direct confrontation against local enemy forces, while others, such as the British or Italian forces, preferred a more "indirect" approach, that of negotiating with the opposition, to name one. The requirement for legitimacy in today's security operations involves the military forces in political issues on a number of levels as well, where they must earn the goodwill and the support of local populations and their leaders,

as well as the support of political leaders and supporters at home. A single misstep by any member of the coalition forces can receive immediate exposure on 24/7 news programs, with the potential of significant impact on public opinion, when we face today that security operations require long-term perseverance and commitment. [15: 93–94]

New Trends in Strategic Interaction

When applying Lykke's strategic ends (objectives), ways (methods) and means (resources) model, [16: 45] the objective is state survival, while the available resources are the instruments of national power, such as diplomacy, information, military and economy (DIME); therefore, the application of national power in order to close the gap between the current situation and the desired end state is the method. Since there is no single authority over sovereign states nor a world hegemon which is able to properly address current and future security challenges alone a multinational effort needs to be generated. It is clear that a pure military solution without (at least) a diplomatic effort cannot achieve a just peace and stable environment. However, according to Clausewitz there is an indirect approach to the purpose of the war—namely to destroy the enemy's fighting forces—the most important of such methods is to make the duration of the war so long as to bring about a gradual exhaustion of its physical and moral resistance. [12: 31–36] This could be best achieved if one has been cut off from the resources. Taken the globally interconnected world the disruption of one's economy may lead faster to the desired end than actually fighting a war. One option for this can be the imposition of economic sanctions, which invariably creates controversy as it is neither rapid nor precise in effect, and because success is difficult to measure. An adjacent and supporting element of the three instruments of national power described above is the information instrument. In extreme circumstances the diplomatic and economic instruments may require the application of military force in order to enforce their activities. However, the widely accepted way of the Clausewitzian understanding of war is the application of armed forces (means) by a state to destroy the enemy's armed forces (aim) to compel another state to follow the former's will (end). By changing one or more elements in this thesis, new forms of political violence are envisaged and it is possible to move away from the concept of war as used in ordinary language. Actually, Clausewitz goes beyond the empiricist definition by linking the tactics-strategy distinction to his schema of means, aims, and ends of war. Translating the still valid political nature of war to politics is the teaching of the use of war. Following this trail, strategy becomes the teaching of the use of combat, while tactics (engagement) is the teaching of the use of armed forces. Therefore, the political level of the conflict means that a nation struggles for its liberation or very existence. What Clausewitz helps to understand is the political and military difference between war proper (regular or conventional) and small war (irregular or unconventional). The strategic aim in war proper is the abolition of the enemy through the destruction of his armed forces. In small war, this relationship is different, since one of the actors is militarily weaker than the other, he cannot directly fight the enemy armed forces but must focus on operations that have direct political results. The concept of the trinity of government, military, and people (nation/society) became the fundamental analytical tool for the study of war. This trinity can be summed up as a function of the variables of violence-hatred, of luck and the skills of the military,

and of the aims of the political leadership. [17: 4–5] A study of historical cases of the last two hundred years of war between 1800 and 1998 conducted by Ivan Arreguín-Toft, shows that the weaker actor actually has a growing chance to win if he plays well on the political level with the interaction of different (direct against indirect or vice versa) strategical approaches. (Shown on Figure 1.)
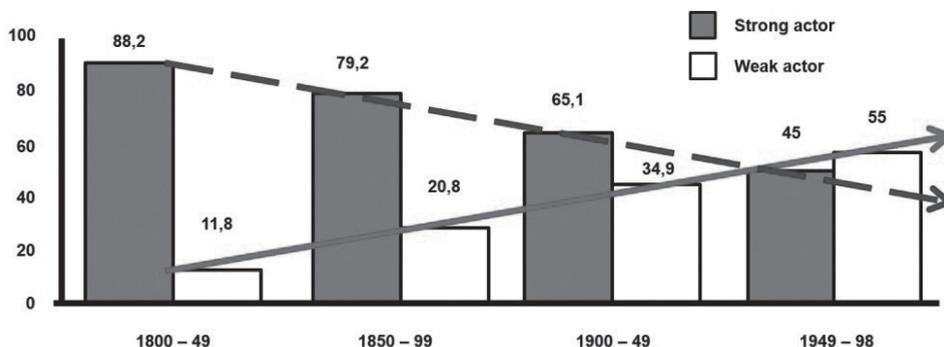

Figure 1. *Trends of strategic interaction.* [18: 97]

Components of the Military Instrument of the National Power – Land-power

Technology alone is not likely to prove able to maintain supremacy without counterbalancing supremacies in conventional forces in terms of both concentrated mass and strategic manoeuvrability. The history of the application of land-power theory in terms of principles of war and operational perspectives suggests that Mackinder was, by and large, right. His premise was based not only on world geography, but also on an analysis of cultures and national intents. The military application of land-power is in practice both cyclical and evolutionary. Mass versus manoeuvre, attrition versus annihilation, or indirect versus direct approaches all demonstrate that the application of land-power is a contextual issue. The operational applications are heavily influenced by the technology available to the antagonists, be it better armour or better firepower, or even the advantages of the fortunes of war. However, regardless of the historical context in which it is employed, the strategic importance of land-power seems to remain a stable and enduring concept. This is certainly true in the modern world, when mass armies and industrialized military forces are predominant. Even in irregular form of armed forces the sources of ammunition, weapons, supplies and equipment are from the industrialized part of the world. Today's changing security environment is not a total departure from the past but is an enlargement of it. Conventional challengers remain among states with strong military capabilities. Unconventional challengers will employ means of terror and guerrilla methods to oppose and in some ways negate the immense technological advantages of high tech armed forces. In such chaotic and unpredictable geopolitical terrain, military responsibilities are not likely to be confined to decisive military operations. Therefore, land-power most likely continues to perform traditional occupation duties and stability operations. Naturally, as this is a distinctly population-oriented activity one can well expect that it will take place where the people are. Land forces will play a predominant role in these operations, designating

armed forces as the lead executive agent for stabilization and reconstruction. Land-power, then, as an element of this 21st century geopolitical environment will extend beyond combat situations and encompass much more than land-oriented military forces, which leads to a wider definition of land-power as the ability in peace, crisis, and war to exert prompt and sustained influence on or from land. Land-power so defined, must be employed in concert with other components of military power. Such joint orchestration will be essential at all stages of implementation of the grand strategy, woven into a context of integrated application of all elements of national power: diplomatic, informational, military, and economic. This will require broader interagency cooperation and increasing joint military interdependence. However, land-power and land forces will be central to the process of transformation. Thus, land-power retains a preeminent role in national defence, as it represents the nation's ability to influence events and persons before challenges to national security and international stability degenerate to become more fractious, more volatile, and less manageable. [19: 109–120]

Sea power

Ever since mankind has been able to build ships and got to sail in ancient times, navies have sought to control communications on the sea. Such control has always been general or local, or temporary. In either case the object of such control has been to protect one's own commerce, disrupt the enemy's actions, move his own army, and prevent the movement of the enemy. At various times and places belligerents have built substantial navies to carry out these missions and in the dynamics of their competitions the notion of command of the sea emerged. *Command* denoted a relative strong relationship between two or more navies in which one can enjoy a significant superiority over the others that provided him the freedom of action in order to carry out the four basic missions of sea power. Innovation and the introduction of the submarine forces and aircraft in the world wars threatened the idea of command of the sea. If the enemy has always the ability to contest control in any area of the sea, whether or not he has a viable battle fleet, there is nothing available to the stronger navy beyond a rather tenuous and local sea control. The onset of the Cold War generated a set of geopolitical parameters that provided unique context. The development of huge arsenals of nuclear weapons created massive disincentives for going to war directly. The power of nuclear weapons meant that a whole fleet arrayed in a traditional formation could be wiped out at a single stroke. In today's globalized world, that is characterized by endemic struggle and conflict, nuclear weapons, the Internet, mass communications, and ubiquitous sensing, the dynamics of interstate, intergroup, and intercorporate relations have produced a world of continuous contention, the characteristics of which are significantly influenced by who can do what in the global commons. Command of the sea is directly associated with overall military and economic superiority that allows a nation to establish a world order on its terms. However, for the purposes of assessing risk in the development of naval strategies and doctrine, it is useful to understand modern command of the sea as a condition of naval superiority that influences other nations' decisions especially as it relates to the maintenance of a global security system that supports the operation of a global economic system. Therefore, nations of the world are becoming economically interdependent, and what the process needs is a comprehensive global security. [20: 22–26]

Airpower

Airpower emerged as an important element of military power virtually as soon as aviation itself existed. Since armies and navies first began to experiment with the use of airplanes as implements of war. In the ensuing years, airpower quickly became integral to the conduct of modern warfare, and sometimes becoming its central element, particularly during the past several decades. Its use and effects are an increasingly important matter of study in international security scholarship; although it is fair to say that land and sea power, with their longer histories and somewhat greater stability of characteristics, remain more familiar to most scholarly observers. Airpower is a vast subject, comprising all uses of aviation in the pursuit of nations' and other political actors' power and security interests including the use of long-range missiles, as well. The evolution of airpower continued at a rapid pace over the following 90 years, driven by innovation in a wide range of relatively young sciences and technologies, by policy choices that themselves created much of the demand for such technologies and also by the often-intense security concerns of the major powers. [21: 1–2]

Just as land warfare underwent transformational changes that altered its nature and dynamics with the rise of mass armies and with mechanisation, and sea power was fundamentally altered by the shift from sail to steam and other revolutions, airpower has experienced a more rapid series of state changes that complicate efforts to generalize its nature and its effects on modern warfare and international security. Airpower was born in World War I but came of age in the conflagration of World War II. In the former conflict, airpower played small though important roles, pre-eminently by providing tactical reconnaissance and observation. In the latter, air forces ultimately comprising hundreds of thousands of far more capable aircraft were central to the conduct of the war. Great effort was devoted to strategic bombing campaigns and saw first strategic bombardment by cruise and ballistic missiles. Furthermore, aerial interdiction and close air support also played a central role in the German blitzkrieg. These were punctuated by spectacular though often costly airborne operations, while air transport became a ubiquitous and sometimes decisive component of military logistics. At sea, naval warfare became dominated by airpower, as aircraft carriers supplanted battleships as principal combatants and aircrafts became key tools in antisubmarine warfare; the war was above all a contest to seize and control bases for land-based air power. Pre-war theorists had foreseen many of these developments, at least to a certain degree. But some of their best-known prophecies went unfulfilled. For example, strategic bombing campaigns failed to produce the sort of rapid, decisive results originally envisioned by many. The end of World War II marked the beginning of the nuclear revolution. Airpower was central to this development, being the delivery means for the *absolute weapon,* and was itself transformed by it. Other technological developments were also altering the still-young art and science of air warfare. Airpower grew ever more capital-intensive and effective, with smaller numbers of aircraft exerting greater influence over larger areas. Over the past 40 years these trends have been dramatically reinforced by the development of air-to-ground precision-guided munitions, stealth aircraft, and new sensors and systems for air battle management, which became the centrepieces of air campaigns not just in war, but in stability operations, as well. [22: 85–114]

Airpower in Low Intensity Conflicts

With most analyses of airpower focusing on its employment in conventional warfare, consideration of the use of airpower in low intensity conflicts has traditionally been a peripheral niche in airpower scholarship and in the broader study of counterinsurgency and unconventional warfare. However, this pattern has lately shifted in response to the prolonged and often frustrating involvement of the Allied forces in conducting such operations in Iraq and Afghanistan. The image of airpower that often springs most readily to mind is its use in the strike role, with a variety of airplanes, helicopters, and UAVs conducting attacks against insurgents, suspected insurgents, or their supporters. Indeed, aerial firepower can be critical to stability operations, particularly since these kinds of operations often involve relatively light ground forces conducting dispersed operations where artillery or other heavy fire support may be unavailable in the event of an emergency. The potential for airpower working together with small or special operations units to become a formidable force on the battlefield was demonstrated recently both before and after the invasion of Afghanistan and Iraq. [23] The presence of aircraft can also play an important role in stability operations even when no attacks are actually launched, by deterring insurgents from moving or massing. However, it is often, even typically the case that the airpower's so-called non-kinetic roles of airlift and intelligence, surveillance, and reconnaissance have even a greater impact in such operations. In all of these roles, airpower tends to operate in support of land forces to a greater degree, than in conventional military operations. [21: 13]

Conclusion

The contemporary world, despite the fact that the political nature of the majority of the states are some sort of democracy, is far from peace and stability; therefore, armed conflicts are with us and the future is likely to be similar. Humanity is currently experiencing a period of considerable transition. Historically, such periods of transition have presented the greatest challenges to the security of nations and the stability of international affairs. Transition and the unprecedented rate of change, combined with the emergence of new threats is increasing global uncertainty resulting in a potential shift from the current international system to a polycentric world, a world that is dominated by dozens of actors possessing and exercising various kinds of power rather than just states. The combination of rapid change, uncertainty, and interconnectedness make the world more dynamic and complex because as global systems increasingly become interdependent, it will be difficult to isolate an individual crisis or event and address it separately. One solution on its own will not suffice as it is likely that any action taken to tackle a single problem will trigger cascading effects in other areas. Multiple accelerating trends will interact and bring about a complex array of effects that will cause major changes that can provoke a change in global politics and societies, as well as in the environment. These changes will create a demanding future security environment containing an even broader range of threats and challenges. Therefore, the problem of security can only be seen as a whole and the solution requires a multidisciplinary, as well as a holistic approach.

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The Role of Churches[1] in Hungary in Providing Pastoral Care and Humanitarian Help for Migrants

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The author is a Lutheran pastor with a Master's Degree in International Relations. He is a Doctor of Military Science (PhD) and a senior staff member at the National University of Public Service, also holding the position of General Secretary of the Ecumenical Council of Churches in Hungary. The publication tackles the problem of how Protestant Churches have been involved in the migratory processes. The aim of this paper is to explore the core function of the humanitarian service provided by Protestant Churches and the Catholic Church in Hungary, with special regard to the ethnic and religious aspects of the refugee problem.
Keywords: *Islam, west, civilization, refugee, church, migration, humanitarian*

Migration and the Mission of Churches

Churches meet the requirements of their mission by performing tasks by providing humanitarian assistance in the form of charity. Therefore, just like the Catholic Church, the Protestant Churches run charitable organizations as well as institutions such as old people's homes, mother and baby homes, drug prevention centres or refugee shelters. Churches display sensitivity to tasks pertaining to social welfare. Internationally, Protestant Churches are also involved in distributing aid packages via their member churches. One such international charitable institution is ACT International. [1]

Europe is to face the biggest surge of refugees since World War II. While the leaders of churches in Europe have raised their voice with the aim of providing shelter to refugees and migrants, emphasizing that the principle of humanitarian treatment has to be applied, political leaders often favour other options: their rationale is determined by quotas or protective fences. Although the church and the state have different tasks to undertake, they share some of the duties to be fulfilled. The principal task associated with the activity of the church is to support those in need of help, which in case of Hungary manifested itself in the fact that it did not have to accept refugees as it was not a target country. Instead, refugees were to be taken care of during the transfer period by providing them with supplies of food and accommodation. In western countries, however, churches and governments also have to brace themselves for long-term problems associated with the settlement and integration of refugees. Viewed from a legal perspective, the responsibilities of a government are different from those of the church. The former has the additional task of both ensuring and maintaining security in view of the currently accessible social services.

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When it comes to public opinion on the issue of migrants or that of immigrants, media footage of this topic generally reveals two kinds of characterization. One shows migrants only as innocent victims in need of support and advice in the western world which is new and unknown to them. The other is the image of aggressive migrants, people who are violent, all of them being terrorists. I think what we have on our hands is far more complex than these two extreme characterizations. Both the culture and civilization where the migrants and refugees come from are different from ours. A tribal society, be it the background of those arriving from Afghanistan or countries in the Middle East or in Northern Africa, makes it difficult or even impossible for these people to adapt to our western type society and civilization. Some of them will be successful in meeting the requirements of integration, some of them will fail to do so. Based on the commands of Christ, the church has to take upon itself the task of providing help to those in need. Migration is, therefore, a course of action based both on the motivation and the decision of an individual, brought into play with the aim of meeting the needs of that individual. Put differently, migration can also be contextualized through the involvement of individuals, i.e. individual ambitions will affect the emergence, direction, composition and permanence of migration. [2] In the light of the above, migration can only be differentiated as a course of action followed either by one individual alone or pursued concurrently by several individuals in a more or less identical manner when considerations such as space and time are taken into account.

Individual migration is an event unfolding independently, both from the point of view of decision and action. While in movement, several migrating individuals might occasionally stick together, but that is a loose relationship which can eventually lead to permanent separation. Individual migration has, from the outset, been an individualistic kind of option to follow. Considerations behind the need for movement are associated with one person alone without revealing a context of close relationships. [3]

The definition of the term *group migration* reveals a relationship among individual objectives. Actions in this case are not confined to *ad hoc* encounters occurring either in a temporal or spatial paradigm, they constitute a group effort where migration is a course of action which, from the outset, is followed in which the mutual interests of migrants on the move are also taken into account. My opinion is that, relationships between individuals and friendships might also be the driving force behind group movement. This kind of relationship can have a crucial role during the departure, arrival or integration of migrants. Situations in which the head of a family or an individual with the strongest potential for income earning embarks on a migratory journey can also be categorized as group migration with the aim of having the family reunited by following, sometime later, [4] the individual who was the first to set out on the migratory journey.

The characteristics of migration that comprises a larger number of people are different from other forms of individual or group movements. The reasons behind mass migration that crosses frontiers might be (and often are) the consequence of natural disasters, although the domestic policy of certain states (violence within those countries) or their foreign policy (war, aggression, international threats) might also trigger it. [5]

In early 2015 Hungary was unprepared for the influx of refugees and immigrants. The commandment to love our neighbour is a commitment for the church to help our fellow human beings who in many cases spend several months on their migratory journey by supplying them with food, drink and hot meals. This was the reason why the church requested

our helpful fellow citizens to take their donations to charity organizations of the church as those organizations are capable of giving help in the most efficient manner by making sure that donations reach their destination.

The primary mission of the church is to help those in misery, trouble or dire need. Solidarity, therefore, is an injunction that cannot be misunderstood.

It is both a right and an obligation for countries to maintain public order and to make every effort in meeting the real needs of the community which they represent. This has to go hand in hand with a very specific commandment of love, i.e. *"whenever we come across people who starve and we have food to offer, we have to feed them."* [25] However, a gesture like this will not solve the huge, worldwide problem on our hands. Therefore, another obligation is to eliminate the reasons behind migration and to create a situation in which everyone can live in peace in their home country. Naturally, this is much more difficult than direct humanitarian help as a fairer economic world order should be established and a more peaceful political environment should be created with the aim of changing entire continents in order to attain that objective. It is the right and duty of every state to defend its frontiers, should the need arise to do so. All over the world border barriers are seen as a method used for border closures, the prevention of illegal activities and the control of the migration of huge masses of people on the move. At the same time, in the absence of around-the-clock technical backup along with support from troops carrying out border patrol, barriers can do little to solve the problem. [6]

Who is to be Granted the Right to Settle?

"Today there are two myths in existence. One is about us being a nation ready to welcome people. In the course of the past thousand years, whoever wished to live here has been granted permission to do so, the doors have always been open. The other being that deep down we are against the idea of newcomers settling down in this country, our inner self being determined by intolerance rooted in our Asian ancestry […] both myths have an element of truth to them, stemming from real experience obtained in the course of history. A misunderstanding will arise if either is regarded as being an exclusively valid approach to reality." [26] These are the words of literary historian Gy. Csaba Kiss, formulated in his concise characterization of the risks inherent in today's popular, over-simplified perception of reality. A chronicle of the historical events that occurred both in Hungary and worldwide could be used to complete Hungarian as well as global history. According to chroniclers, Hungary had, since the organization of the state of Hungary, been a place offering asylum to those seeking refuge. During the reign of St. Stephen the *Böszörmény* tribes, (Ishmaelites) were allowed to settle in Hungary. During the rule of King *Kálmán* (Coloman the Learned) the Kabars and, in the 13th century the Cumans were forced to take refuge and settle in Hungary. In the mid-sixteenth century the *Habans* (Hutterites), were forced to flee because of their belief in Anabaptism, settled in Hungary, while some of them moved to Transylvania in the 17th century. However, there was no valid pattern to apply for the reception of those seeking refuge during a mass migration.

In the Middle Ages the term *asylum* was only used to protect individuals found guilty of a crime. The creation of a comprehensive system tackling the problem of migration

both legally and administratively, which was also capable of coping with a huge number of refugees, being at the same time geared to the needs of asylum seekers who were not guilty of a common criminal offence, took place only as part of Hungary's modernization. This is partly due to the fact that foreigners had more freedom to move as it was only in 1886 that an administrative law stipulating the movement of foreigners was enacted. [7]

International organizations such as the World Council of Churches or the Conference of European Churches have also issued statements on the subjects of migration and refugees.

The Churches' Commission for Migrants in Europe (CCME) and the World Council of Churches (WCC) have together issued a publication tackling the problem of migration in Europe and the response of churches to that challenge. [8] The document focuses on the problem of global migration, using churches in Europe as an example, looking into the issue from the perspective of theology and sociology.

The Rev'd Darell Jackson, missiologist, and sociologist Alessia Passarelli have jointly (as authors) issued a publication which includes theological reflections, the assessment of findings pertaining to sociological research and the personal accounts of immigrants. The publication comprises topics such as *integration, personal ties* and *community.* It highlights both the experience of immigrants and the manner in which their presence shapes or helps create church communities in Europe. [20]

This publication is the updated version of a similar work, a previous collection of studies. Its findings are based on a comprehensive questionnaire, containing answers from member churches, including the contribution by the refugee mission of the Reformed Church in Hungary. Its aim is to help better understand the key aspects of migration and the discrepancy between the response given by European societies and the churches in Europe. In today's globalized world emigration and immigration are grave political problems with serious ramifications, affecting every section of society, turning the current religious environment into a more colourful one, also having an impact on the churches' concept of mission and the practices thereof. The current migration and refugee crisis to which Europe is exposed is an opportunity for churches on the old continent to both accommodate the needy and to extend their protecting hand by offering help to those in need, while defending the principle of human dignity, a right to which even the weak and vulnerable are entitled.

Migration as a phenomenon is as old as humanity but—unlike the case of our ancestors, the decision to migrate is less a decision for life—except, of course, the case of forced migration, when those on the run seek refuge from violence and war. People no longer have a lifelong commitment to live in the same country. They often live in various other countries before they return to their home country.

Today's migration and refugee crisis reached Europe in 2015. The global ramifications of the Arab Spring, along with a crisis brought about by the current political situation and the war in the Middle East, are obvious—inevitably so. "Last year put both the friendliest and ugliest complexion on the way Europe responded to" [27] unprecedented numbers of refugees along the borders of the EU. The crisis, which has not ended to date, has involved over sixty million people so far. The conflicts and persecutions forced those people to leave their homes. Two thirds of them found refuge in their home country, while one third crossed frontiers, seeking international protection. A significant number of those leaving their home country found refuge in neighbouring states. In Syria alone, twelve million people became

homeless, while more than four million live outside the country—Jordan, Lebanon or Turkey and around the world.

In the absence of help and as a result of resettlements, refugees took matters into their own hands. By the autumn of 2015 a total of 723 thousand people had crossed the Mediterranean with a death toll of around 3,400. Unlike in previous years, these refugees came mainly from Syria, Eritrea, Iraq and Afghanistan. The number of new refugees is high and Europe should be braced for even higher numbers as the more protracted the crisis, the more refugees are forced to leave their homes. To keep the situation under control is, however, still not impossible for the 28 EU member states.

The question is this: who should be allowed to settle? Everyone or anyone who claims to be persecuted for religious or political reasons? Should refugees be in possession of identification documents or all they need to do is name their home country? In the words of Imam Miklós Kovács Ahmed who represents the Hungarian Islamic Community, "should the go-ahead for the acceptance of refugees be eventually given by Hungary, the country would only be ready to take refugees who have undergone the necessary security screening, people who can become useful citizens of the country. We do not want extremist Muslims who resist integration into our society." [9] The world is not becoming universal. It is becoming global. Globalization, however, should go hand in hand with multiculturalism, cultural diversity and richness. Presumably, otherness will remain an inseparable part of our world for a long time to come. Science and technology will not put an end to diversity. On the contrary: it makes possible for various civilizations to preserve their characteristics and embark on the journey of modernization by following their own traditions. This might also be the future for the Islamic civilization. Islam will need to preserve—and change—its orientation towards tradition, just as it did during the early centuries of history, by reacting flexibly to new phenomena and by accepting it, while integrating them into its system and allowing them to become part of its traditions. [10] The only solution is to separate radical and orthodox Islam. Solidarity within the Muslim world plays into the hands of radicals. Only an Islamic cultural war will be able to reshape the frontiers between radicals and moderates so that the latter might come out the winner. It is of crucial importance that a struggle like this should not lose sight of the religious foundations of Islamist terrorism and that this should create a counterbalance recognized by the moderates and the public, as well. Quran, contrary to what many think, does not encourage violence. [11] In my view, due to the proliferation of violence, Islam will, in the face of terrorism killing innocent people, need to follow this road all over the world in the future. The struggle will be a difficult one, given the unpredictable nature of asymmetric warfare. However, when a specific conflict needs to be addressed, those with the highest level of expertise and professionalism should be used to tackle the problem at hand, both on the Western and on the Islamic side. [12]

The churches are seen pulling their weight in tackling the current conflict. For instance, in October 2015 the WCC, together with the Evangelical Lutheran Church in Bavaria, organized a high-level meeting for the heads of European, African and Middle Eastern churches with the aim of fostering closer cooperation among themselves. In Europe, migration brought to life a more active and multifaceted manifestation of the presence of Christian churches. The churches of individual countries are affected by the crisis to a varying extent and in various ways. As a result of immigration and the activity of volunteers, mobilized to provide assistance for the refugees, several minor churches are seen gaining significance. An illustrative

example of this is the rising number of Protestants in Italy and Ireland, the strengthening of the Roman Catholic religious community in Sweden or the growing Orthodox Christian community in France. A growing number of congregations and denominations speaking various languages are to be found in the cities of Europe. However, it is almost impossible to make an accurate estimate of the actual numbers involved, given the continuous movement of people and other rapid changes. In many European cities churches provide both unselfish and unconditional help for refugees and migrants. All participating churches share the view that the biblical message of unconditional solidarity and human dignity, to which all human beings are entitled, is an important principle to be followed.

The Refugee Mission of the Hungarian Reformed Church

A total of one hundred refugees are integrated annually into the Hungarian society by the Refugee Mission of the Hungarian Reformed Church (HRC). The mission has been operational since 2006 and has a permanent staff of three plus an additional staff of seventeen, paid via funds assigned to specific tasks, along with a total of around sixty volunteers. The work they perform has manifold aspects: their task is to teach the Hungarian language and culture, they are in charge of the accommodation and food provided for refugees, they provide access for children to public education, while offering legal help to foreign (mostly African) migrants currently in refugee status. After a four-year training period, when refugees have achieved an adequate level of the Hungarian language, the mission staff will help them enter into employment.

The work performed here is neither spectacular, nor can it be completed in a rapid manner. Mission data shows, however, that the work effort of the staff has a high degree of efficiency as around 90 per cent, sometimes a hundred per cent of the refugees they provide assistance to are successfully integrated into the Hungarian society. These people will never become criminals and the work of the mission is indicative of the fact that Hungary is not a country that bows to xenophobia. The refugees themselves describe Hungarians as helpful, kind-hearted people. [13] At the same time, experts seem to disagree on the maximum number of those who can be involved in the integration programme.

The number of people who were granted a refugee status was between three hundred and five hundred even when only a few thousands of refugees made it to Hungary, and that figure did not change when the number of those crossing the border was around 40 thousand. A possible reason behind this is that those fleeing from places from where escape is the only viable option face severe hardship. Moreover, these people undergo the ordeal of having to keep moving around in various places for several years before reaching Europe. Initially, they cross frontiers to go to the neighbouring countries—for example from Afghanistan to Iran, having no intention of leaving their home for good—where they wait for two to three years, hoping to hear the news that might allow them to return home. Then they move on to other countries and, in a period of seven or eight years, they will have spent one or two years in a total of four countries. In other words, these people will need to familiarize themselves with the customs and the system in four countries and will also need to speak the local language with at least some degree of success in those countries.

Many among the refugees are Christians suffering from persecution which they are subjected to for religious reasons. In most cases, however, this information will never be made public, the reason being that those who wish to settle in Europe are faced with the reality of animosity towards those who have fled for religious reasons. While the 1951 Refugee Convention [14] stipulates that any human being persecuted for reasons such as religion will be regarded as a refugee, refugees are advised by western authorities running the migration centres in Europe not to mention religion among the reasons of refuge. The European Union keeps facts related to religious persecution under wraps.

The Refugee Mission of the Hungarian Evangelical Lutheran Church

The Diaconal Department of the Hungarian Evangelical Lutheran Church (HELC) has a number of projects, many of which are operational, while a number of them are in a preparatory stage. All of them are intended for the assistance and support of refugees.

The Evangelical Lutheran Church is involved in various projects; the Evangelical Diaconia, for example, in cooperation with the social network and those providing pastoral care, is involved in rendering assistance to refugees by supplying them with their basic needs such as water and food and by looking after unaccompanied underage persons on their migratory journey. [15]

As part of a separate project, clothes donated to children are collected for distribution and information, both coming from and meant for young people; these are compiled in the schools. Also, refugees are offered information in various languages, while the church is also involved in the so-called *crisis intervention.* The opening of the House of Integration, another project, is also in the offing. This service is intended for refugee families who stay in Hungary and is offered for the duration of one year.

With the assistance of the Association of Paediatrician GPs in Hungary, the Diaconal Department of the HELC also donates medical supplies to child refugees in need of help. [16]

Several congregations and priests have also offered refugees assistance on a voluntary basis. The HELC has published a brochure in various foreign languages, e.g. English, French as well as Persian, Urdu and Arabic.

Evangelists, based on Luther's doctrine of the two kingdoms, make a distinction between the secular and spiritual realm. The former is the responsibility of politicians, the latter is that of church leaders. If possible, they do not wish to interfere directly with issues relating to secular politics.

The Refugee Policy of the Catholic Church in Hungary

The refugee policy of the Hungarian Conference of Catholic Bishops is to provide assistance for people whose arrival in Hungary is the outcome of their dire situation. "We are glad to act by approving the appeal to admit and help refugees and are also prepared to do whatever is necessary to achieve that end. Words of encouragement spoken on the issue strengthen

our resolve to carry on with the work. We express our thanks for the inspirational guidance along the paths of the Gospel, which puts us on the right track for action." [17]

However, it needs to be made clear that despite the current refugee crisis the most important responsibility of the Catholic Church is to carry out its pastoral duties by helping Catholics who have for some reason been forced to leave their homes. Both the first church documents and the activity of the gradually established church institutions appear to substantiate this. Meanwhile, the Holy See and local churches both undertake humanitarian and diplomatic action to address, both globally and locally, the refugee problem. It has also become imperative for the church leadership, due to a rapid succession of events, to carry out an ad hoc evaluation of the situation. But the words of encouragement, coming from the Pope or the Holy See, are not to be interpreted as a statutory law. They are guidelines for those public administration organizations within the church which provide humanitarian help and pastoral care for immigrants. Although the significance of this should not be underestimated, it should not be overestimated, either. It is not about the amendment of specific regulations or the creation of new institutions. The situation has changed with the emanation of a motu proprio entitled *Humanam progressionem* on the 31st of August 2016, which led to the foundation of a new *Dicastery for Promoting Integral Human Development* inside the Vatican. [18] Nor is it about the distribution of tasks. It is about adopting a fundamental attitude and determining moral principles. Moreover, not every local church institution is adequately equipped with the kind of infrastructure or financial and human resources required for the task at hand. [19] The refugee problem is mostly tackled as part of the social teachings of the church. Documents produced by the church were reflections on a social phenomenon if for some historical or economic reason it became relevant, or if emigration became a general, global security issue. In tackling the problem of emigration, there is a varying level of scrutiny detectable in the Pope's statements. These statements are not supposed to create a legal framework.

The Role of the Ecumenical Church and the Activity of the European Union

Mapping Migration, an English language publication, [20] is a collection of studies in theology and sociology, also including some personal accounts. This publication has essential infographics, as well, to help readers understand today's most acute crisis. This collection of studies was first recommended for public attention during a conference on the issue of refugees, organized in Geneva between 18 and 19 January 2016 by the WCC and the UN.

The member churches in Europe of the Lutheran World Federation (LWF) are committed to placing decision-makers under more pressure, so that they adopt a more welcoming approach in dealing with refugees. [21] In a closing statement summarizing the position of the LWF at the end of its Trondheim conference, the leaders of forty member churches called upon the European Union to launch an initiative, identical with Operation Mare Nostrum, with the aim of searching and rescuing refugees in the Mediterranean.

Additional documents written by church leaders reflect the view that "the secure journey of refugees from places such as Syria, Iraq etc. should be ensured." [28] "The statement

includes the recommendation that a fairer system for the distribution of refugees should also be created—churches of the countries in the region affected are called upon to ensure that these urgent issues are raised with their respective governments." [22]

As a reminder, church leaders emphasized the fact that the LWF has, since its foundation in 1947, always been sensitive in its approach to the issue of refugees. In the aftermath of the Second World War, European churches integrated many refugees. "For us as churches it goes without saying that to regard migrants and refugees as our brothers and sisters is a fundamental matter of attitude and that we have to assist them by all possible means." [22] These are words quoted verbatim from a document produced at the end of the conference.

That document underlines that when it comes to refugees forced to leave their home country, the current figure, which is in excess of fifty million, is the highest of its kind since World War II.

The church leaders remarked that "the lives of many of those trying to make it to Europe were put at risk during the journey." [22] According to figures published by the UN Refugee Agency, more than 36 thousand migrants and refugees crossed the Mediterranean this year alone with the aim of reaching the coasts of Southern Europe, 1,600 of them having died at sea.

The first supply of aid, coming from the Evangelical Church, was delivered to the camp at Nagyfa on 1 July 2015, by the Hungarian Interchurch Aid. This was followed by regular aid provided during the next two months for migration centres at Vámosszabadi and Bicske, along with another registration location at Röszke.

The Hungarian Interchurch Aid was also involved in a regular aid effort elsewhere. The aid effort was extended to Barcs and Horgos near the Croatian border, where the supply with food and drinking water for a continuous influx of migrants from Croatia was ensured. [23]

As for a balanced approach to immigration, the EU's efforts on this issue are focussing on creating a balance between tackling the problem of legal migration and dealing with the issue of fighting illegal migration. Proper measures in dealing with migration movement include fair treatment of third country citizens staying legally in an EU member state, stepping up efforts to fight illegal migration and promoting a comprehensive cooperation with third countries. To ensure that legal immigrants are granted the same rights and have the same obligations as EU citizens is a principal objective for the EU. [24]

As regards the principle of solidarity, in accordance with the Treaty of Lisbon, the policies shall be governed by the principle of solidarity and fair sharing of responsibility, including its financial implications. (Article 80 of the *Treaty on the Functioning of the European Union.*)

As a final thought on the issue I have to say: in my view, in the current migratory situation in Europe the church should continue to carry out its mission. Migration is a significant challenge for the Christian community; it poses the question to what extent that community is both ready to accept and capable of dealing with cultural differences. Accept means to love people and to take them seriously, to make it possible for everyone to be themselves and to ensure that they experience no sense of threat for being different from others. The actions of the church have to be guided by its mission: the principle of solidarity. The church is responsible for the management of a number of institutions involved in helping refugees who reach the frontiers of Europe. The church has no intention of acting as a replacement for the state, but it has to react to human suffering. It cannot, at the same time, ignore the reality that a legal framework must prevail for all migratory movements. In the absence of this, those movements will pose a threat to public order.

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Military Vehicles Used for Public Service Purposes[1]

György GÁVAY[2]

The aim of the publication is to examine and present the need and possibilities of using protected vehicles in the police and disaster management forces. One of the questions arising nowadays is what threats the police and disaster management forces are facing at the locations of terror attacks or environmental catastrophes. The reduction of the tűhreats is possible with choosing the appropriate vehicles and ensuring their proper usage.

Keywords: *public service, terror attacks, protection requirements, MRAP vehicles*

Introduction

The publication describes the connection between protected (armoured) vehicles and public service tasks, the need for using protected vehicles and their ability for protection. Its aim is to summarize the information dealing with the needs and possibilities of using protected vehicles in cases of crimes typical to the present day, as well as areas struck by a catastrophe.

The term protected vehicle mainly refers to protection against an attack, but the given ability to protect can also be used for other harmful events not caused by an attack. The aim of using a protected vehicle is to prevent and lessen the harmful events of an attack or harmful events not caused by an attack, to protect the lives and physical safety of the person(s) within the vehicle's inner space. The term *protected vehicle* used by the Hungarian home affairs organizations refers to vehicles carrying protected individuals.

For the clarification of harmful events the terms threat, endangerment and safety need to be investigated. The publication divides the categories threat and endangerment into two parts. One contains the threats caused intentionally, by humans, while the other contains the threats caused by natural or industrial catastrophes. It is an interesting fact that the vehicles built for avoiding the first category worked out surprisingly well with disaster management activities.

Based on the above, this publication deals with the topics of threat and safety, the used vehicle types and their design as well as ballistic protection and protection against explosion.

It is hard to pre-define the risk and intensity of an attack carried out by hostile individuals, as well as the direct and indirect effects of a natural or industrial catastrophe. All the same it is required to be prepared for the protection of personnel on duty and executing public service tasks in the given area.

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Protected Vehicles

The term protected vehicle can be easily defined based on the topic of the publication. A vehicle that can move by self-effort and provides protection for those inside from intentional and unintentional harmful events. This ability to protect is always present without any help from the outside.

The military vehicles can be structured based on the aspects of protection. Ballistic protection and protection against an explosion are such aspects. It is also important to clarify that such protection capabilities can be reached in an active or passive way, in this case only the passive protection capability will be discussed.

Based on the above, a protected vehicle can be an armoured car or an armoured vehicle made for military purposes. The *protected vehicle* used in police terminology and mentioned in the introduction means the vehicle and the individuals within protection by the organization's own personnel.

Public Service Tasks

The literature used for the preparation of this publication, both national and foreign sources and case studies mention personnel carrying out tasks who are part of organizations that belong to national or—in case of the US—federal governance. Taking into consideration their executed tasks, those organizations that are not public service organizations still carry out rescue activities also need to be mentioned since they have a licence to operate issues based on a separate legislation.

Basic Terminology of Public Service

When defining [1] public servants or public service employees we look for individuals who can be subject to public service legal relations. To be able to identify who can be a public servant, first the word public service needs to be defined. Starting from the linguistic origins of public service, the service provided for the public can be considered the source. Not everyone can be the subject of public service, the above linguistic approach is only valid for the public sector.

The most broadly interpreted public service legal relations are in connection with the following organizations, such as:

- elected representatives of the legislative and national representation bodies (Members of Parliament and local representatives);
- personnel of the justice organizations (Court, Prosecutor's Office);
- personnel of the public administration (public servants);
- personnel of the organizations performing public duties that are operated by the state (hospitals, schools, social institutions);
- further individuals or personnel of other organizations performing public administration tasks;
- employees of state-owned companies;

- members of public foundations and public corporations;
- and last, but not least the personnel of armed and other law enforcement organizations (police, national defence, military, fire-brigade).

Henceforth I am going to use the term public service task execution, which refers to the work of the police, ambulance, disaster management personnel as well as the military forces involved in disaster recovery and counter-terrorism activities.

Vehicle Usage in the Public Service

Public service is defined by the executed task and the organization, since based on the terminology public duties need to be carried out at a public service body.

The publication discusses the public service tasks already mentioned in the introduction. It takes into consideration branches of public service where vehicle usage is inevitable and where the usage of protected vehicles might be required. These include law enforcement, military and disaster recovery activities, as well as related lifesaving actions. When executing military operations, there is no reasoning required for the usage of protected vehicles and most of the military industry developments target this field. The need of the law enforcement organizations for using protected vehicles is visibly growing, but other aspects of the organizations' appearance in the civilian environment also need to be taken into consideration. The effect of the presence of a military vehicle [2] at a busy location, the impact it has on the sense of security and feelings of the civilian population are important questions, but of course safety needs to come first. In a civilian environment a known military vehicle can even raise panic, in contrast to a less military-looking vehicle.

Law Enforcement and Internal Security, Personal Protection

Since the 1946 Jerusalem explosion [3] the world got to know the meaning of terrorist activities affecting the civilian population in the modern era. Since then law enforcement authorities are facing a new requirement in almost every developed and developing country, which is the need to transport their personnel safely to the location of the event to be able to secure the area. The safety of the personnel needs to be looked at together with the threat. The publication does not take a stand on the likelihood and applied equipment of any future action, but takes the offensive equipment used in past events as examples and does not exclude the threat caused by them or the usage of more powerful weapons.

The dangerous actions against which protection is needed can be outlined based on certain events of the near past, since multiple terror attacks have happened in the previous years where the perpetrators have used unusual weapons.

Police Forces, their Task Structure and Vehicle Usage

It is hard to decide which public service organization faces the biggest danger, but the personnel of the police forces that is in direct contact with the civilian environment can be most rapidly mobilized and is of the biggest headcount. Vehicle usage is inevitable for carrying out the tasks of these organizations, and the task execution requiring vehicle usage has the biggest risk in this case taking into account the number of events.

The Tasks of the Organizations that Belong to the Ministry of the Interior

Taking a look at the below listed tasks [4] of the police it becomes clear that there is no item on the list where vehicle usage would not be needed and in most of these cases the usage of protected vehicles also seems required even for an outside observer:
- as a law enforcement investigative authority police prevents and detects crimes;
- as an authority it contributes to the prevention and detection of offenses;
- it carries out the official tasks associated with the production, distribution and usage of equipment and materials threatening public security, approves and controls the personal and property protection, as well as private detective activities;
- it carries out law enforcement, as well as traffic authority tasks associated with maintaining the order of public areas;
- it ensures the personal safety of participants of criminal procedures and the members of the authority carrying out the proceedings, protects the lives and physical integrity of individuals considered as highly important for the interests of Hungary, guards the appointed institutions;
- it executes activities related to enforcement of sentence;
- it carries out law enforcement tasks transferred to its authority in case of a state of emergency, state of preventive defence, state of disaster or disaster threat;
- it guards the state border, prevents, detects and stops any illegal crossing of the state border, it carries out the immigration control and asylum related tasks transferred to its authority as well as controls the persons and vehicle traffic crossing the state border;
- it carries out the legally defined internal crime prevention and crime detection related inspections;
- it detects the terrorist organizations operating on Hungarian territory, it prevents these organizations from committing crimes, it prevents any organization or individual from providing financial or any other support for terrorist organizations from Hungarian territory;
- it carries out further tasks declared in laws or government decrees as well as binding acts of the European Union or international contracts. It also participates in peace support and civilian crisis management activities organized by the UN, EU, OSCE (Organization for Security and Cooperation in Europe), NATO or based on international contracts.

The specific tasks and the vehicle usage are in close connection with the task structure of the police. [5] Activities that require vehicle or protected vehicle usage will be introduced below:

"March" is the activity of the unit force that is in close connection with tactical processes, manoeuvre types and also supplements these. March is the purposeful and organized movement of the personnel with standard or augmented carrier vehicles or on foot. The bonds can execute the march individually or in march columns.

"Closure" is a general tactical process that can occur as part of personal and object protection activities, higher level inspections, safety activities or location protection, which can occur in the following cases:

- activities regarding the protection of law and order, traffic, immigration control and law enforcement;
- event protection;
- at the location of a terrorist attack or other serious crimes;
- at the location of a catastrophe or a mass-casualty incident;
- capture of an armed individual on the run, who has committed a serious crime;
- crowd dispersion as part of the activities of the protection unit.

When preparing a closure, the following needs to be taken into consideration based on the task:

- the number, armament, known and expected actions of the armed fugitives and wanted individuals;
- the size, composition, mood and intentions of the crowd present at events;
- the traffic conditions of roads and railways;
- the status of public transport;
- the available forces and assets;
- characteristics of the area;
- the season, time of the day and weather.

The strength of the closure team can be enhanced with armoured vehicles. The pit is the fire-position of the magazine-fed weapon or armoured vehicle established at the closure line, its power is constituted by the firearm and its operators.

The checkpoint is established by a unit (closure team, protection team) at a predefined location for the inspection and control of the departing person and vehicle traffic, as well as the compliance with the restrictive regulations. Upon establishing a checkpoint, the following aspects are important:

- the protection of the assigned personnel;
- the safe and secure execution of the inspection.

Among others, the assigned personnel can be supported by transportation and armoured vehicles.

At the closure line within inhabited settlements the different types of cordon devices, constructed obstacles, road blocks and vehicles need to be widely used for the strengthening of the closure. In this case it is mandatory that the vehicles are parked back-to-back or in

V-shape occupying the whole road junction and the pavement in a way to make a quick drive away possible if required.

Taking into consideration the traffic safety, the police force can also establish a road block in the course of a traffic restriction set up in order to capture the offender. The road block is a coercive instrument for arresting and capturing individuals escaping police measures with a vehicle and it forces them to stop by installing for example vehicle(s) in a barricade form.

Vehicle usage as well as the usage of armoured or protected vehicles (terminology used in this publication) is also necessary when operating the following units:

- pursuer team;
- capture-liquidation team;
- cover-support team;
- insurance team;
- sentinels.

The aim of event insurance is to provide the conditions required for the legitimate, uninterrupted arrangement of events attracting a large crowd and to maintain the safety of persons, wealth and traffic at the event and its surrounding locations. The aim of insuring large locations is to provide the conditions required for the uninterrupted execution of damage prevention or damage control in a defined area, enforcement of closure measures, fulfilment of public safety tasks in connection with disaster recovery or other measures aimed at the protection of civilians.

Counter Terrorism Centre

The conditions of safety and national security have changed fundamentally. The most significant security threat affecting the Western world is terrorism. The law enforcement authorities need to face terrorist organizations [6] and the cooperation of groups operating at locations geographically far from each other. The Counter Terrorism Centre (in Hungarian: Terrorelhárítási Központ – TEK) is a law enforcement authority under the command of the Minister of the Interior and has jurisdiction over the whole territory of the country. Its mission is to detect and abort serious criminal offenses of terrorist nature, such as terrorism, kidnapping, capturing aircrafts, vehicles of public transportation on railway, water or road, as well as transit vehicles.

On request by the law enforcement authorities TEK is also responsible for capturing armed individuals suspected of committing a crime, as well as stopping other violent crimes against persons, and it carries out detective, preventive and law enforcement tasks, too.

Organizations Responsible for Rescue Tasks (Ambulance)

The operating environment as well as the activities carried out by the personnel of organizations responsible for rescue tasks are governed by the 5/2006. (II. 7.) EüM (Ministry of Health) regulation. [7] In case of terrorist attacks and catastrophes, the rescue options can best be determined or assessed on site or as close to the location as possible. It is obvious

that securing the area is the responsibility of the Disaster Management and police forces and it needs to be executed as quickly as possible so that the doctors performing rescue tasks can help the injured people as soon as possible.

The paramedic officers, ambulance doctors, paramedics and drivers (referred to as ambulance) need proper attention and concentration skills to be able to act in case the alarm goes off. Their work is stressful and requires great presence of mind especially in cases of unexpected catastrophes or mass-casualty incidents.

The job itself is subject to numerous dangerous situations (life or health threatening circumstances) that can occur due to:

- traffic conditions;
- contact with people endangering themselves or the public, as well as suffering from infectious diseases;
- working environment.

Apart from the ambulance station, the ambulance staff works at different locations, where also bad road conditions or harsh weather need to be taken into consideration when visiting the injured people and the locations of the accidents. After arriving at the location, occasionally open-air work is required as well, for example in case of traffic accidents or sports events, where tasks need to be carried out while facing harsh weather conditions. For the sake of the study's topic it is more important to stress that the duties also need to be executed at dangerous locations, for example in case of fires or chemical disasters, but of course only in maximum compliance with the protective measures required by the situation (fire and acid proof equipment, oxygen mask, etc.). [8]

Having a relative sense of safety can help remarkably when carrying out the tasks at a dangerous location. Using a special vehicle can make moving at a hard-rough surface and working in a dangerous environment easier and safer.

Disaster Management

A new organizational structure was formed at the Ministry of the Interior, National Directorate General for Disaster Management (in Hungarian: BM Országos Katasztrófavédelmi Főigazgatóság – BM OKF) on 1 January 2012 together with the April organizational changes and in line with the new act on disaster management and its executive government and ministerial decrees for carrying out the outlined tasks. This stands on three pillars: industrial safety, civilian protection and fire protection. The activities of the national chief inspectorate for industrial safety established for carrying out industrial safety tasks cover four main professional areas. These are the supervision of dangerous plants, the inspection of transportation of hazardous goods, the protection of critical infrastructures and the prevention as well as recovery of nuclear accidents. [9]

When the explosion risk still exists in case of an industrial accident or catastrophe, a vehicle that can approach the area can be required in order to inspect the situation.

Applied Vehicles

The vehicle fleet of the home affairs organizations is very diverse. It mostly consists of patrol vehicles based on regular personal vehicle types as well as other supply vehicles such as vans or minivans. Some of these can be 15–20 years old, but the average age of the vehicles is being reduced thanks to procurements. The patrol cars that make up most of the service vehicle fleet are enough for the everyday activities, but the already introduced more risky tasks require armoured vehicles.

Adapting to the conditions of the surface attributes, off road ambulance cars also exist, but there is no equipment that would provide protection from attacks. For this purpose, help from other public service authorities is or could be required.

The vehicle fleet of the Disaster Management is also diverse, ranging from off road vehicles to fire trucks.

Today's Threats and the Need for Using Protected Vehicles

In today's Europe the threat caused by terrorist attacks has increased significantly. Shootings, explosions and wilful run-over actions that aim at increasing the number of civilian victims and threatening the population happen almost every month. Capturing vehicles of public transportation or mass-transit is happening more and more often as it is rather easy and quick to implement.

These activities result in an immediate intervention from the public service side. It is hard to identify beforehand the dangers of the public service work done at these occasions. This difficulty needs to be overcome somehow, since the public service task execution can be carried out with best efficiency if the personnel involved is aware of the threats, is prepared for these and has at hand the available equipment for protection.

The situation handling after activities committed for the threatening of the civilian population can have a very strong and negative effect on the public service personnel performing duties on site. The stress management and prevention of post-traumatic behaviour of the personnel working in disaster management is highly important, since their work and service is required in the long run. The introduction and short analyses of several up-to-date examples will follow below.

The Criminal Attempt Against the Editorial Office of Charlie Hebdo in Paris

Taking account of recent violent acts, one is considered specifically brutal by the police. The editorial office of the Charlie Hebdo magazine was attacked by individuals armed with AK-47 type automatic rifles. Apart from civilian victims, a police officer on duty also died. Video recordings are available of the crime, the weapons used are visible in the pictures taken from these videos. [10]

Picture 1. *Terrorist attackers in Paris.* [11]

The attackers did not care about the state of the injured police officer, they have executed him in a coordinated way covering each other, thus it can be stated that they would have opened fire at the arriving police forces, as well. The attackers were shot after a three-day manhunt.

Considering the weapons and ammunition used by the aggressors, they would have been able to attack an armoured vehicle with STANAG 4569 Level 2 protection capacity and this significantly increases the level of danger the arriving police forces were facing.

Criminal Attempt in Norway

Two coordinated criminal attempts hit Norway on the 22nd of July 2011. At 3:30 p.m. local time an explosion happened in the centre of the capital, while a few hours later tragic shootings were reported from Utoya, located 10 km from Oslo, from a camp organized by the Norwegian Labor Party. [12]

According to reports, it took 50 minutes for the police to arrive at the location of the shooting. They were taking a car as the helicopter was not on standby, so it took them 20 minutes to get to the lake and another 20 minutes to find a boat available to reach the island located a few hundred meters from the shore. The offender was using a Glock 34 pistol and a Ruger mini rifle. [13]

The massacre was committed at a location hardly accessible, approaching the area caused problems, and even though a large explosion has already happened previously, [14] based on the available data and pictures, the authorities first arrived with patrol vehicles.

The murderer declared his surrender on the phone, claiming he has accomplished his "mission", so he showed no sign of resistance. [15] Even if an attacker indicates giving up, this cannot be taken for granted.

In the above example the assassin could have effectively shot at the police officers and ambulance team arriving from the other side.

Picture 2. *The scene of the explosion in Norway.*
The explosion happened in the near vicinity of the main government building. [14]

The aggressor planned the double criminal attempt in detail, prepared an enormous number of explosives, and even though according to the video recordings he did not park the van carrying the explosives at the originally planned location, a significant amount of harm was caused. Along this line of thinking, if another explosion happened 20–30 minutes after the first one, it would have had fatal consequences for the ambulance and police forces that arrived at the location.

As a summary it can be stated that according to the Hungarian terminology, the personnel carrying out public service tasks (police, disaster management and ambulance teams) were approaching the crime scenes with vehicles that would have been unable to provide protection in case of another attack aimed directly at them. The attack was clearly aimed at the ministry employees, therefore against public service workers.

Firearms

All armed aggressors have carried out the attacks with firearms. One of the most widespread assault rifles, the AK-47 or one of its subtypes or successor types was used at the attacks against the editorial office of Charlie Hebdo in Paris. The assault rifle is an automatic rifle

equipped with stock and is capable of single shots or multiple rounds. It has a medium barrel length and is using rifle rounds. One cannot be specific about the type as this weapon has numerous subtypes and one of the characteristics of asymmetric warfare is that the enemy uses any firearm that they find available. The subtypes of AK-47 differ in barrel length, calibre, stock design and further accessories. Typical rounds used:

- 7.62 × 39 mm (M43);
- 7.62 × 39 BZ – armour piercing incendiary;
- 7.62 × 39 AP (hard steel or tungsten carbide core armour piercing incendiary);
- 5.45 mm (M74).

According to data from the early 2000s, around 80 million pieces of AK type rifles were manufactured worldwide. [16] They are sold for a few dollars at the African markets and smuggled through Western Asia to India in large quantities.

At the time of the former Yugoslav crisis a high number of weapons and ammunition vanished from abandoned munition and arms manufacturing factories as well as military bases. [17] Such equipment can reach Western Europe through smuggling. [18] The Serbian police caught a group of ten smugglers and seized 9 kg plastic explosives, 20 kg TNT, electric detonators, 111 hand grenades, 2 rocket launchers, 12 armour piercing grenades, rifles, machine guns, other weapons and ammo during the operation. The whole list contained more than 6,000 items. Firearms trafficking began to flourish at the time of the former Yugoslav crisis (1991–1995). Data from 2011 suggests that around 2.5 million households own 3 million illegal weapons.

The rifle used in Norway was a Ruger mini, the perpetrator even bought an optical sight for it. This rifle fires 5.56 × 45 mm bullets and can fire well aimed and effective rounds up to a several hundred metres distance.

It is obvious that a protected vehicle capable of providing shelter from this weapon needs to be selected for the protection of the public service personnel.

Capturing Vehicles of Mass-Transit

In recent years several incidents happened that made it clear that mass-transit vehicles can easily be used for committing crimes against human life. One of these events happened in Nice, where around 10:30 p.m. during a celebratory fireworks a truck slammed through the crowd for a two kilometre distance with an approximate speed of 80 km/h and drove in a way to hit more people, while also shooting into the crowd. According to a journalist who was present at the location and saw what happened, there was blood everywhere and many injured people. [19] [20] At least 84 victims and more than 60 injured have been reported.
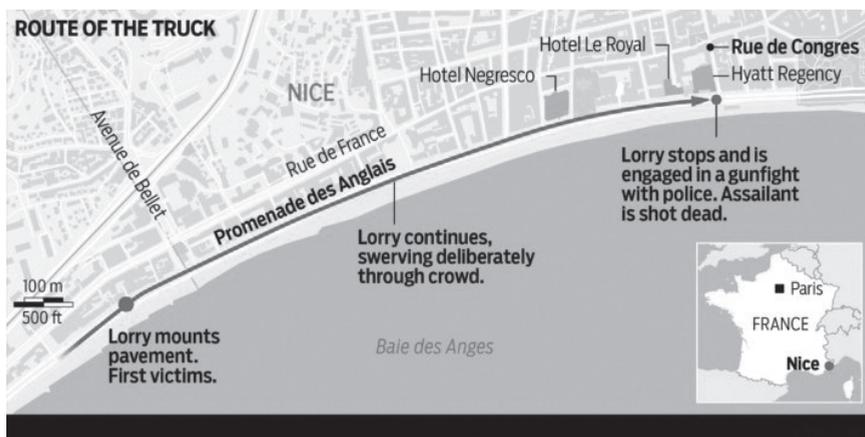
Picture 3. *The scene of the tragedy in Nice.* [21]

Picture 4. *Police and Ambulance at the site of the tragedy in Nice.* [22]

The attacker was a man of Tunisian origin from Nice who was shot by the police. It is still unknown whether he had any allies. A large amount of ammunition and weapons were found in the vehicle he drove, on the plateau of the truck.

The secondary consequence of such attacks is that the panicking people fleeing the location can get injured. The situation is well described by the fact that a temporary hospital had to be established. Taking into consideration the lessons of the incident, the German police has already secured the carnival in Cologne with armoured vehicles that can serve as sufficient mobile road blocks due to their size and weight. These vehicles mostly work as a deterrent and by collision they can also change the movement direction of heavy vehicles.

Picture 5. *The armoured vehicle of the police in Cologne.* [23]

Protection Requirements in Light of the Threat

Taking into consideration the introduced dangers wilfully caused by humans, the forces carrying out law enforcement activities as well as public service tasks need to face the following problems:

- high possibility of weapon usage in case of terrorist activities;
- possibility of manufacturing large number of explosives in a short time period, but more importantly in a barely or non-traceable way;
- terrorists mostly focusing on the end result of their activities, while protecting their own physical integrity or life is inferior to the purpose of their actions;
- attacks that can also be carried out by European residents;
- riskiness for official personnel to approach areas of questionable safety by vehicles without proper reconnaissance information;
- possibility of rifle and assault rifle usage, therefore preparation for utilization of weapons of increased fire power as well as armour-piercing ammunition even from a few hundred meters distance is required.

The protection requirements in this case target the effects caused by weapons and explosives. Taking into account the wave of migrants commencing from the Near East or Africa and going through the Balkan states or Southern Europe, the possibility of having larger calibre or even armour-piercing weapons transported to Europe from the areas affected by armed conflicts needs to be considered.

Requirements for the Applicable Protected Vehicles

The protection of the personnel executing public service tasks could be remarkably increased by using special protected vehicles. For the selection of proper vehicles, the required characteristics need to be summarized:

- strong off-road and obstacle-conquering capability, i.e. stairs or roadsides at inhabited areas should not mean any obstacle;
- the ability to maintain the capacity to move is also important, i.e. the vehicle should be able to change its position and move forward even with damaged tires;
- capability of quickly changing its position, but high-speed change of direction is not required – quick response and no vehicle for hunting is needed if establishing a road block is required;
- it can serve as a shelter against weapon fire;
- it can serve as a shelter against explosion and fragmentation effect;
- due to its protective capacities it can be used for rescuing injured individuals;
- it needs to be able to operate without outside assistance and without endangering others on the road.

The Possibilities of Using Protected Vehicles

Using a Mine Resistant Ambush Protected (MRAP) vehicle might seem obvious for securing the location at endangered areas or areas struck by a terror attack or disaster.

Picture 6. *Navistar Maxxpro and Force Protection Cougar type MRAP vehicles.* [24] [25]

The MRAP [26] vehicles have been used by the United Stated Armed Forces since 2004 as part of an experimental training; the MRAP program was launched in 2006. The category I and II MRAP vehicles had to meet well-considered criteria matching the combat application. In a civil environment the following criteria are the most important: [26]

- forward speed of at least 100 km/h on a paved surface with a 0% gradient;
- off-road speed of at least 7 km/h;
- 40 km/h speed on dirt-road;
- minimum speed of 10 km/h when conquering a dirt-road surface with a 40% gradient;
- no malfunction within 170 hours of operational time based on an average of 18-hour usage per day, which means 10 days of continuous use without any failures;
- transportability of the vehicle by rail, marine, and air as well as on all main roads and highways individually or as part of a convoy;
- all tires need to have a run flat capability in case of any tire damage;
- 50 km/h speed on a paved surface even if two tires are damaged;
- diesel engines capable of functioning in all environmental conditions.

The military usage also requires the following attributes, but these are not of high importance in a civilian environment:
- capability to fill the vehicle with fuel sufficient for driving 480 km on a paved surface with an average speed of 70 km/h;
- no failures should arise when driving no less than an average of 1930 km;
- capability of being transported by C–17, C–5, C–130 aircrafts;
- preparation for fixed wing air transport, and follow-up reassembly to be accomplished in not more than 60 minutes.

The most important requirements were related to increasing the safety of the soldiers, but they can also mean the protection of the personnel carrying out public service tasks:
- capability of the armour to protect the personnel travelling in the vehicle from explosions, fragments and other effects arising from the vehicle falling over due to the explosion;
- the STANAG 4569 [27] contains the number of explosives matching the protection levels;[3]
- capability of the armour plate below the interior area to resist explosions happening under the vehicle and to protect the personnel from fatal injuries.

Furthermore, the MRAP vehicles are capable of:
- climbing surfaces with a 60% gradient;
- conquering vertical barriers of 36 cm (vertical step);
- moving in 90–95 cm deep water without any preparations required (fording).

An MRAP vehicle is capable of carrying out the following tasks:
- securing an area;
- presence;
- patrol activities;
- providing protection for the personnel executing public service tasks;
- Pursuit Intervention Technique against another vehicle;
- approaching areas with risk of explosion.

Maintaining mobility is highly important for the usability and applicability of these vehicles. Using run-flat tires is recommended for heavy vehicles, especially for protected vehicles. Tires equipped with a support ring make it possible for the vehicle to drive at 50 km/h for another 80 km.

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[3]   Test and evaluation methods are described in the AEP 55 Vol. 1 [28]

Picture 8. *Run-flat tire with support ring.* [29]

Protected Vehicles of MRAP Category Already Used by Disaster Management

Using MRAP vehicles for public service tasks has already started and the experiences are being gathered.

The Law Enforcement Support Office had 196 MRAP vehicles transferred to different law enforcement agencies until August 2013. As many as 780 agencies have expressed their intention for using the vehicles.

The requesting agencies wish to react to arising needs such as the specific requirements of armed conflicts, anti-drug and SWAT missions. The requesters were aware of the special maintenance needs and rather high costs of the vehicles. [30]

At the time of the MRAP program closure approximately 25,000 appliances were available. These vehicles have definitely saved some 4,000 lives, since they provided protection against ambushes committed with weapons or bombs that became an everyday threat.

In the Unites States the decrease in the number of MRAP category vehicles was caused by the regulation of the Armed Forces budget and the increase in the equipment value. [31] However useful they had proved to be previously, the Pentagon wanted to discard several thousand MRAPs. It was stated at the meeting of the Senate Committee on Armed Services in March 2014 that it is cheaper to destruct the vehicles at their location of application (US $10,000) or to donate them to allies in the region than to transfer them to the United States (US $50,000).

The cost of the devices during their in-service time is hard to estimate, but it became obvious that based on the decision of the US Government the aim is to use these vehicles that became a burden in the most optimal way. The urge to decrease the costs has shown an interesting field of application in case of armoured vehicles.

Homeland Security Investigation (HSI) New Orleans is one of the first ones to be equipped with a Mine Resistant Ambush Protected Vehicle. [32] The objectives of the application of the new devices were the following:

• rapid deployment during natural and manmade disasters;

- providing immediate support for the Immigration and Customs Enforcement (ICE) in case of emergency situations.

Weighing 16 tons and approximately 3 meters tall, this heavy-duty vehicle was well suited for emergency high-water rescue operations in New Orleans during the disaster. [33]

The weather conditions made even more difficult the rescue activities; an approximately five hours of rainfall and storm surge, as well as the flood waters that rose above a safe operating level considerably hindered the operation.

In one of the cases, the Special Response Team and Rapid Response Team were able to jump into action within minutes of receiving the request and forging through the water-logged streets managed to rescue 12 individuals. Since then the team is operational 24 hours a day, seven days a week and is always prepared to deploy to an affected area within 12 to 24 hours.

Special armoured vehicles have already been used in a special situation as well, where a SWAT unit broke into a house in Phoenix, since a man had barricaded himself and shot at the arriving police officers. [34]

Conditions of Using Protected Vehicles

When examining the usage of a new vehicle, the following requirements always need to be determined:
- Which organization is operating the device?[4]
- Which organization is planning the operational and maintenance costs?
- Which organization provides the trained driver and operating staff?
- If required, how and under which circumstances will the vehicle arrive at the location? Is it allowed to operate individually, without escort or route licence?
- Where should the device be based?

Due to their extent, operation and maintenance are not discussed in detail in this research, these require further examinations. The already mentioned disaster management usage can serve as a basis for clarifying the operating organization. The human resource need and its feasibility also need to be clarified henceforward, but the training of the operation staff is possible. [35] Training and maintaining the qualification level is necessary, as unfortunately an accident has already happened in the US that was caused by an untrained and unlicensed driver. The root cause of the accident was a tire blowout that made the driver lose control over the vehicle. The accident could have been avoided with proper driver experience, as it is possible to keep going also with injured run-flat tires. In such cases it is especially useful if the driver is notified of the pressure shrinkage in the tires. [36]

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4   The BTR-80 fighting vehicles used by the Counter Terrorism Centre are the property of the Hungarian Defence Forces.

Picture 9. *Accident caused by an inexperienced police officer
with an MRAP vehicle.* [35]

In Hungary the conditions of road usage need to be taken into consideration when applying the vehicles. Decree Nr. 36/2017. (IX. 18.) issued by the Ministry of National Development contains the data applicable to vehicles equipped with tires. "The material scope of the regulation comprises the transport of vehicles and combinations of vehicles exceeding the allowed total mass, axle load, tandem axle (axle group) load and size (hereinafter referred to as overweight or oversized vehicles) on national roads, on local roads and by state or local government owned not enclosed private roads." [37] Based on the decree, if an MRAP category vehicle meets the requirements of Table 1, it is allowed to use the road network of Hungary without a route licence.

Table 1. *Technical specification of vehicles subject to route licence.* [Edited by the author.]

Axle load	Two axles vehicles (MRAP category I.)	Non-driven axle[5]	11.5 t
		Axle	
		Total weight	>20 t
	Three axles vehicles (MRAP category II.) with tandem axle	Any axle, or tandem axle, if the distance between the axles is not larger than 1.00 m	11.5 t
Width			2.6 m
Height			4 m
Length			12 m

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[5]   Although the requirements are stated in the text of the regulation, yet every axle of an MRAP vehicle is driven.

Granting approval for the transport of overweight or oversized vehicles is done by the Military National Security Service or in case of the transport of vehicles operated by the Hungarian Defence Forces or by others operating on behalf of the Hungarian Defence Forces, the organization outlined in the ministerial decree on vehicles exceeding the allowed total mass, axle load, tandem axle (axle group) load and size is the authorized approver. The Hungarian Public Road Non-profit Plc has jurisdiction in case the vehicle is operated by another organization and the expected routes cross several administrative territories owned by the local government.

Table 2. *Technical specifications of MRAP vehicles.* [Edited by the author.]

Technical specifications \ Vehicle type	Oshkosh MRAP (M–ATV)[6] [38] [39] [40]	Cougar 6 × 6 [41] [42] [43]	Cougar 4 × 4 [43] [44]	Maxxpro [45] [46]
Seating (person)	4 + 1 (7)	2 + 8	2 + 4	2 + 4 (8)
Maximum road speed (km/h)	104	104	105	105
Gross weight (kg)	2,000	29,257	19,504	18,650
Payload (kg)	1,814	n.a.	4,000	1,655
Length/ Width/ Height (m)	n.a. n.a. n.a.	7.0 2.6 2.64	6.35 2.71 3.02	6.0–6.7 2.51 2.92
Number of doors (side, rear, on the roof)	2 (4) + 1 (0) +1	2 + 1 + 1	2 + 1 + 1	2 + 1 + 1
Range (km)	512	512/670	672	600
Military operations	MEDEVAC,[7] reconnaissance, convoy support, other special tasks			
Trench (m)	0.5	0.5	0.5	0.5
Vertical step (m)	0.5	0.5	0.5	0.6
Fording (m)	0.9	0.736/1.00		0.91
Gradient	60%		60%	70%
Side slope	40%		30%	30%

Equipment Selection and Procurement

The introduced vehicle specifications suggest that response options are available for the defence requirements outlined in the publication, but this is not sufficient in itself. Assigning to each other equipment or tasks that were introduced as examples requires a very detailed analysis. [47] All conditions of the vehicle usage need to be taken into consideration. [48] Procurement of these vehicles is rather expensive, the equipment acquirable from abroad also cost US $600,000–1,000,000 even in a used state.

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[6]   M–ATV: MRAP All-Terrain Vehicle.
[7]   MEDEVAC – Medical Evacuation.

Picture 10. *Two separately configured vehicles from the Komondor family.* [49]

The Hungarian military industry is already capable of producing vehicles of such protection levels by ordering and purchasing the parts and components from vendors who are in connection with Hungary and are executing their production activities here. [50] [51] The product range of Respirátor Ltd. contains differently configured vehicles as part of the Komondor family. The aim of the first vehicle improvement was the creation of an equipment capable of NBC reconnaissance. [52]

Conclusion

Based on the introduced scenarios and possible threats a vehicle with appropriate protective, off road, barrier conquering and mobility sustaining capabilities is required in case of disasters or terror attack prevention activities, apart from which it could also be effectively used for law enforcement tasks as a road block or shelter. If the turret has not been installed or has been removed, a neutral coloured MRAP vehicle rather looks like a truck. This means that it will not be regarded negatively by the civilians on the streets, while an armoured combat vehicle causes mixed feelings in the population. The presence of the vehicle at a crowded event undoubtedly signals the preparedness of the law enforcement forces and this can have a deterrent power, as well.

There are vehicles that are suitable for this task and can be used on public roads, as well. Appropriate methods exist for optimizing the procurement results and if required, the Hungarian military industry is capable of producing the equipment with the desired protection capabilities.

The questions concerning requirement and feasibility need a detailed analysis and the possibility of establishing new organizational units or organizations dealing with the equipment need to be investigated.

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China: The New Key Protagonist of International Security

Attila KASZNÁR[1]

"For this reason, when a ruler who has comprehended the Way (Tao) is about to employ his people, he will first bring them into harmony, and only thereafter embark on great affairs."

Wu-tzu

The People's Republic of China has become one of the leading superpowers in the World; its capabilities to protect its interests embrace not only some regional areas of the Asian continent but practically the entire World. This heading has not only positive consequences but negative effects, as well. Obviously, there are many different fields where security risks can threaten the Chinese interests. One of the most important is that parallel to the growth of China as a great power, the exposure to terrorist threats against the Chinese colonies living around the World is also growing.

Keywords: *China, security policy, religion, terror, superpower, international security.*

Introduction

As the People's Republic of China becomes a global power, its role as a superpower might have many peculiar features different from the development of the previous historic superpowers. This probability is high even if we consider these lines true: "we never would have thought that the rules of being a superpower would be different in case of China than in case of any other country achieving the same status." [1: 133] At its base there is nothing but the special understanding and perceiving the World based upon Confucianism. This religious-philosophical mentality system not only influences from time to time the Chinese domestic and foreign policy but due to its specific opportunities it can be a permanent factor exercising a basic influence with strategic consequences. Many events of the Chinese history prove that the classical political way of thinking built upon the Confucianist basis can divert the foreign policy intentions of the Asian country just to the opposite direction of the Western ideas. The accelerated process of globalization of the last decades of the 20th century opened new opportunities for the intentions of the Chinese foreign policy driven by Chinese philosophy.

This widely spread way of thinking mentioned above which is also the motive of the specific features of the Chinese domestic and foreign policy, constituted the basis for the classical

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foreign policy with building intentions formulated in 1990 by one of the greatest Chinese politicians of the 20th century, the mastermind of the Chinese economic miracle Deng Xiaoping, aiming the worldwide rise of the People's Republic of China. Deng said: "China must be a calm observer in the international area where its utmost priority must be to assure its position, to avoid remarkability and the leading role until its time did not come." [2: 4] Following the words of this great politician, the People's Republic of China has made a really "big jump" in the last three decades. Its result is that "China has gained its proper place in the world, drawing on its generally peaceful international relations to provide the context for its booming trade. The country which once suffered under the unequal treaties imposed by foreign powers now helps to fund the US federal deficit." [3: 678–679] It seems that the actual leaders in Beijing consider that it is time for the Chinese state to implement strongly than ever before its interests in the international area thus playing in the future the role of a real global superpower. This is also reflected in the ideas expressed by the President of the People's Republic of China, Xi Jinping, on the 19th Congress of the Communist Party of China held between 18 and 24 October 2017. He made it absolutely clear that the country must undertake a leading role in the World. At the same time, this does not mean that the People's Republic of China would give up its refined international policy built upon the traditions of the Confucianist philosophy, carried out by carefully developed and from a strategic point of view consisting of a complicated series of rational and well-conceived small steps. What certainly can be expected is the rise of new strategic points.

The fact that Xi declares the status of a global superpower of the People's Republic of China raises many actual social, economic, cultural and political questions. Obviously, the majority of researchers pay attention to the economic side because—as it was clear according to Deng Xiaoping's words—the People's Republic of China had been concealing its military, strategic, law enforcement and other capabilities related to these areas up to the latest years. At the same time, the People's Republic of China's economic leading role is imminent and is undisputable even for outsiders. The current situation needs some explication because "there are discussions about how the power of China growing with amazing speed during the years 2000 can be integrated into the global structure of power. It becomes more and more clear that China is the most important challenge of the American hegemony." [4: 50] With other words: the security policy of the Chinese leadership has many segments but the present study focuses mainly on a narrow slice of the security policy, i.e. being a superpower and the terrorist threat as a consequence of it.

China as a Superpower

In case of China, historical traditions determine the fact of being a superpower because in historiography China can mostly be referred to as an empire. In this case we can accept the words of the famous British historian, Stephen Howe about empires. He wrote: "it is a complex political entity with huge extension, embracing many people or nations, emerging as a consequence of conquest, composed of a dominant center and subordinated peripheries often far from the center." [5: 40] It is a good question to what extent the actual China fits this expression acceptable in a historical context. The answer is unambiguous, inasmuch as the People's Republic of China "due to its extension, economic, political, military power

and cultural influence plays a leading role in international life" [6: 8] and meets more and more the basic requirements toward being a superpower. Observing the events, the People's Republic of China has achieved today the aims set by Deng Xiaoping in 1980, except the criteria of democracy:[2] "The goal of the building work for the socialist modernization is to achieve the level of the developed capitalist countries, to create a more clear and real democracy of higher standards, to educate and train more and better specialists than in these countries." [7: 110]

If we analyse the characteristics of the worldwide economic control of the People's Republic of China we can see that this country has chosen an extremely particular way not only in its internal policy but in its international expansion, too. We should not forget that the motive at the background is the same as in case of other countries: the need of satisfaction of demands of raw materials, acquiring new markets. Based upon the analysis of the on-going processes the further mid-term or even long-term expansion of the People's Republic of China can be forecasted without a risk. The opportunities of the exploitation of raw materials have been significantly changed during the last decades, and as a result of these transformations the resources has become Chinese property.[3] This fact basically changes the correlation of powers emerged after WW2, and also questions the future competitive potential of the former great powers – mostly the leading countries of Western culture. The actual correlation of powers and their development tendencies—sometimes their retrogradation—show that the United States is the only factor which can be a potential counterweight against the control of China holding in its hand the growing slice of the high-tech production of the World. The emerged situation visualizes the appearance of a new bi-polar world order where the advancing of the People's Republic of China and the regression of the United States is expected – as the consequence of the correlations described above.

In this newly forming system quite a lot of new moments are also to be expected. Their character will be determined by applying the Confucianist ideology to use the capitalist methods for the global positioning of the People's Republic of China implementing Chinese socialism. Notwithstanding, "a natural feature of high-tech capitalism is the permanently increasing productivity and the growing intensity of the working rhythm, and at the same time, high-tech capitalism has made possible to achieve a higher living standard and better nutrition and higher consumption, as well." [8: 16]

If we agree with the idea of the world-wide known philosopher of our era Slavoj Žižek, we can come to the conclusion that the global control and the economic development transform the demands of the Chinese internal market so much—increasing its purchasing capacities i.e. the internal consumption—that as a consequence the satisfaction of the demands of goods can shrink in other areas of the World. Due to the appearance of *deficit economies* which emerged as a consequence of the deficit of goods in different regions combined with the effects of climate change can bring a situation when tens of millions of people

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[2]   Naturally, the different concepts of democracy can generate many discussions because beside the Western concept of democracy many other ideas can be the subject of political and professional discussions.

[3]   As an especially interesting point, it worth mentioning that one of the strategic ideas of Deng Xiaoping was that the People's Republic of China should focus on obtaining access to the resources of rare metals. The result today is that 90% of the global resources are in Beijing's hand. This fact is a clear national security risk for the majority of the countries with developed electronic and military industry since rare metals are indispensable for these fields of industry.

will be obliged to leave their previous living areas exposing the whole developed world to the security and safety risks caused by a contemporary migration of people. In another way: if we analyse the connections of the facts we can arrive at the conclusion that one of the indicators of the contemporary migration processes is the People's Republic of China becoming a superpower.[4]

The Special Background of China as a Superpower

As stated previously, today, the status of superpower of the People's Republic of China has become indisputable together with its special components. In addition to the well-known superpower factors, in case of China it is important to mention the specific religious-philosophical background which—due to the superpower achievement of the Far Eastern country—has become a dimension in the general security policy. The fact that in the focus of the Chinese socio-philosophical thought is the family and not the individual offers a special background which makes the actuations of the Chinese not only un-understandable and unforeseeable for societies based on the philosophy of individualism but it also makes difficult the cooperation in the international political field. The states constituting the current international system mostly observe the positioning of the People's Republic of China which shakes at the base the previous system of frames and creates new dimensions possibly provoking new security risks, as well. Without any doubt, the most notable moment of this new security environment is the world-wide Chinese economic control. In case of China, the economic expansion is accompanied by the rise of Chinese migrant communities or colonies which in their turn create a special fundament for the further global Chinese positioning and control.[5]

The parallel processes—the People's Republic of China becoming a new superpower and the appearance of the new colonies world-wide—mean new security challenges for Beijing.

The fact that the People's Republic of China and the Chinese are present everywhere in the World may become a source of numerous conflicts even if we admit that the Chinese immigrants can integrate in the hosting society practically with fewer conflicts than any other migrant communities. This can be seemingly confirmed by the words of Samuel P. Huntington who said the Chinese nationals "almost in the majority of the South-Asian countries are the economically dominant minority. They have assimilated in the Buddhist Thailand and the Catholic society of the Philippines and there are only rare cases of violent anti-Chinese acts from the majoritarian groups." [9: 451]

We can state that the Confucianist thought and the Chinese immigrant communities' network following these ideas give a special background for the People's Republic

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[4]   This is not a critical remark on the Government of Beijing. This is just a fact which can fit any state which achieved a similar level of development.

[5]   The emigrants of China have a compact system of religious-philosophical values which is the basis of their behaviour and activities in their new circumstances and guides the relations to each other and their motherland – including the material, moral and political support of their relatives and homeland. One of the key moments of the People's Republic of China becoming a superpower is the formation of a network of the religious-philosophical system through the Chinese migrant communities which is a significant advantage in building the Chinese system of power. About the importance of the role the Chinese communities play in becoming a superpower read more in source [17].

of China to become a superpower, although they represent a number of security risks both for the hosting countries and Beijing. Having a huge number of Chinese nationals beyond the borders creates a special risk for Beijing because by attacking these groups, the People's Republic of China can be blackmailed or forced to take undesired measures.

The Appearance of Terrorist Threats Concerning China as a Superpower

The experience related to security policy shows that the primary security challenge for the centres of power is not the classic threat any more but the asymmetric warfare, terrorism that is "basically a political phenomenon with structural and psychologic factors." [10: 5] István Gál's words confirm what previously has already been set out that China becoming a superpower—especially the fact that this goes on in the international political space—makes the People's Republic of China a new target for global terrorism. Parallel to the growth of the activity against China and the Chinese nationals on behalf of the terrorists, the attitude of Beijing toward terrorism will change "the majority of steps of fighting terrorism related to its persecution more and more depends on the level of the terrorist threat of the given country and society." [11: 46] It seems the actions against terrorism undertaken by the People's Republic of China in the future will be concentrated less and less on the territory of the country and will acquire a more international character.

At this point it is important to determine what are the specific features of the terrorist threats against the People's Republic of China as a superpower, what kind of terrorist challenges China has to face in the near future. The terrorist challenges against the People's Republic of China can be split into four big groups:

a) internal terrorism;
b) terrorism from abroad;
c) terrorist attacks against Chinese interests;
d) terrorist attacks against the Chinese colonies.

Now I'll give an explanation to every kind of possible threat:

a) Internal terrorism in the People's Republic of China has a long past and it can be linked mostly to the Uyghur national group. The separatist movements of the Uyghurs have exercised traditionally outstanding influence on the security status of the Western side of China, especially in Xinjiang, the Uyghur Autonomous Region. The most significant separatist group, the Turkistan Islamic Party (TIP) aka the East Turkistan Islamic Movement (ETIM) has been formed up to the end of the 20th century. They are responsible for the majority of attacks perpetrated on the territory of China. [12] The radical Islam organization has the intention of creating a giant Islamic state from China to Turkey, therefore they maintain close relations with the communities with similar ideology in the region and with the Islamic State, as well. The fact that the ETIM has become an active member of the international terrorist network visualizes the growth of the internal terrorist attacks in the People's Republic of China.

b) As a superpower, the People's Republic of China has to face in the future the fact that the international terrorist communities of foreign origin will more frequently consider Beijing their enemy and the Chinese state their primary target. These terrorist groups which "during the perpetration of their operations cross one or several state borders" [13: 68] can find several opportunities to penetrate into China's territory and perpetrate attacks there. One of the main opportunities to *infiltrate* is that the member organizations of global terrorist networks, such as the Islamic State, after losing their main operational scenes can transform into an unconsolidated, often cell-like operational structure. In this form the members with different nationalities can transfer their operational scenes to the best-known areas i.e. to their homeland where they can also become perpetrators and can facilitate the penetration of the infiltration of terrorists of other nationalities and their illegal activities. Another point of the infiltration of terrorists into the People's Republic of China has an implication of migration; the further development of China generates demand of labour force what provokes economic migration. It is also expected that the illegal immigration to the People's Republic of China will become an important problem soon. Its signs are already seen: the number of the black workers coming from South-East Asia is significantly growing. This massive influx can serve as an excellent cover for terrorist communities.

c) The international role of the People's Republic of China is increasing thus the country appears in the focus of attention of terrorist communities. Parallel to this the number of attacks against Chinese interests—factories, mines, installations, workshops, and even against tourists coming from China[6]—can become more frequent. This wide-range target is only a part of the targets of the terrorist acts of previous decades. The exposure of Western citizens to terror on the primary operational scenes of the potentially dangerous terrorist organizations is doubtless. There have been a huge number of attacks perpetrated against Western citizens—tourists or workers—on the territory of the primary operational scenes of terrorist organizations. It is also probable that the Chinese coming from China will be exposed to this kind of threat in the future.

d) As told previously, the Chinese colonies bring significant advantages to Beijing, building its status as superpower in the process of peaceful multidimensional control but nevertheless, they are exposed to different threats and dangers. One of the threats is terrorism which can target the Chinese communities living in many points of the World. Their protection against terrorism has difficulties unknown at this level; due to the difference from other superpowers, an appropriate method to combat had not yet been elaborated.

It seems that due to its status of superpower, the People's Republic of China and its complex region can be exposed to different forms of terror threat coming from different directions. Handling these problems needs significant forces.

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[6]   About tourists coming from a given country and becoming targets see in detail [18].

Conclusions

There is an ever recurring question that if globalization transforms the World, why would China be the only exception? Well, it is for sure that the global processes which have helped the People's Republic of China to become a leading country in the World will influence the Chinese society, at the same time we should not forget the eternal words of Lin Yutang concerning the Chinese: "The more we change the more we remain who we have been." [14: 354] These words disclose that the more active role the Chinese will play in the international security policy processes their participation will follow their own way composed meticulously and intentionally of small and well-elaborated steps. It will give them time to learn the challenges and to elaborate the most efficient steps from the position of a global power since "the preparation and training are important and determining factors because this is one of the ways of successful warfare, including the economy of human lives." [15: 13]

Parallel to the economic prominence of the People's Republic of China embracing all continents, the global positioning of the appearance of migrant communities with Chinese religious-philosophical conscience is growing. The Chinese immigrants constitute the basis of the contemporary Chinese superpower-policy since they can make the hosting country economically dependent and can contribute to the process of the peaceful conquest called *cultural osmosis* by Henry Kissinger. [16: 550]

It can also be forecasted that responding to the global control of Beijing and as the People's Republic of China becomes a superpower, the actions of global and local terrorist organizations against this country will become more active. Of course, as a reaction to the increasing terrorist activity Beijing will be forced to take more active than ever measures countering terrorism. This process is a self-generating one: the more significant military and law enforcement measures can lead to more radical actions on behalf of the terrorist organizations and their activists. After the elimination of a terrorist organization newer terrorist communities can and will emerge much more bloodthirstily than before which will mean a new challenge for the Beijing Government. After a short analysis of these reflections one can easily come to the conclusion that the People's Republic of China will become an outstanding role-player of the international struggle countering terrorism.

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Australian Involvement in the Malayan Emergency

József ONDRÉK[1]

Australian defence and foreign policy experienced a great shift in 1942. From that year on, the nation began to think of itself as an independent entity, and a key player in Southeast Asia. The first armed conflict that Australian units participated in after the end of the Second World War was the Malayan Emergency, where all service branches contributed forces to the successful counterinsurgency war. The aim of this article is, firstly to look at the events and factors that initiated this shift in Australian policy, and secondly to analyse the forces the nation committed to fighting the Emergency. This analysis includes the fighting forces of the Royal Australian Air Force, the Army as well as the Navy.
Keywords: *Malaya, Emergency, Australia, policy, defence, operation, Cold War, Southeast Asia*

Introduction

Australia's relationship with Southeast Asia has always been a very interesting and at the same time a significant one. During the age of colonization, this region served as a spring board to reach that *great uninhabited southern land,* as the explorers of that time saw it. Later, following the First Fleet, and the complete colonization of Southeast Asia, the relationship turned to be an even closer and complex one. On the one hand, Australia had good bilateral trade relationship with this resource-rich region; while on the other hand, it also regarded the dominions of the British Empire as a defence guarantee for its own self-defence. Since the kings and queens in London were half a world apart, it was Malaya and Singapore, which acted as a forward military base, upholder of British interests in this part of the globe, and finally as a warrant reassuring Australia of defence from outside aggression. As industrialization became a major economic factor Down Under too, the ties became even closer, since Malaya's cheap tin and rubber was vital to Australia's economy.

This close and mutually beneficial relationship was severed by the outbreak of the Second World War. The fall of both Malaya and Singapore—along with the fall of the Dutch East Indies—significantly weakened European presence in the region. This created an entirely new security environment for Australia, something that the only 41 years old nation at the time had to cope with. The aim of this essay is to analyse one instance of post-World War II (WWII) measure of how Australia as a nation tried to face this new security situation in the second half of the twentieth century. Australia's role in the defence of Western interests in Southeast Asia grew remarkably in this period and the country's participation in many armed conflicts—especially the Malayan Emergency and the Vietnam War—further underlines this. Australian participation in the Malayan Emergency is thus significant for various reasons.

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Firstly, it was the first major overseas commitment after WWII. Secondly, it was the first time that Australia had to fight a limited counterinsurgency (COIN) war against politically inspired revolutionary forces, and finally, because in many ways, the events of Malaya paved the way for the Vietnam War.

It is also important to mention that the conduct of the Malayan Emergency is considered by many COIN experts a successful model of how to fight a war that in addition of achieving military victory has to "win the hearts and minds of the population." Australia committed a relatively small force to the fight but gained invaluable expertise in jungle and COIN warfare as well; this makes the analysis of the country's involvement in the Malayan Emergency interesting in the light of recent world events. The analysis of the events and forces in this essay also supports the latest requirements of military science research, which finds it essential to process and incorporate the lessons of military history into both officer training and education. [1]

Australian Defence Policy in the 1950's

Australian foreign policy experienced a major shift during WWII. As mentioned earlier, the fall of both Malaya and Singapore—and as far as security assets were concerned the loss of His Majesty's Ships *Prince of Wales* and *Repulse*—eradicated the sense of security and British protection that the country enjoyed until "Japan's bombings of Darwin and Broome in 1942 brought home the vulnerability of white Australia and challenged the legitimacy of British rule over [...] Australasia." [2: 154] This wakeup call ushered Australia into a new foreign policy agenda, which symbolically started with the Statute of Westminster Adoption Act in 1942, when the Australian Parliament formally adopted the Statute of Westminster from 1931. The Statute gave the dominions right to act independently of the British Parliament, and the adoption of it signified a change in Australian foreign policy from focusing on the United Kingdom to the United States. This was indeed a significant and unexpected change, since when Prime Minister John Curtin's Labor Government took office on the 7th of October 1941, the new Minister for Foreign Affairs dr. Herbert Vere Evatt's first speech in Parliament had emphasized that there would be no vital change in Australia's foreign policy. [3: 39] In a few months' time, external events changed the course of Australian foreign policy decidedly.

The end of WWII altered the strategic situation once again. Outside factors, such as the new Cold War divide, the First Indochina War and especially the Chinese Civil War were seen as security liabilities in Southeast Asia. The outbreak of the First Indochina War in 1945—whose leaders Ho Chi Minh and General Vo Nguyen Giap applied the Maoist theory of revolutionary warfare for national liberation perfectly—already caused grave concerns as far as Western foreign policy objectives were concerned. However, it was the fall of China to Communism after the long and bloody civil war that served as a trigger point for the creation of Asiatic defence organizations. Furthermore, the role Australia began to plan for itself after WWII showed that "the pre-war isolationist thinking [...] had all but disappeared. A new era of post-war Labour Party idealism, and concern for Australia's future security, shaped immediate post war foreign policy." [3: 41]

The 1949 Federal election in the country changed many things, the Labor Government was replaced—for a long time to come—by a conservative government lead by Robert

Gordon Menzies, but the main foreign policy objectives remained the same. The notion at the time was that "the United States and Great Britain, had not formulated precise policies for the Asian area. […] Therefore, a greater burden of responsibility for security in the South East Asian area, would rest with Australia." [3: 41] Under such circumstances, it is clear to see, why the country abandoned its isolationist policies and actively sought membership in defence organizations.

The first of such *organizations* in the region was ANZAM, which stands for Australia, New Zealand and Malaya in 1948. The threat to sea lines of communication in Southeast Asia (SEA) was the main reason behind the creation of the agreement, but "ANZAM itself was not a treaty but rather an agreement between participating naval forces on certain higher command functions necessary for the protection of maritime trade." [4] As of 1948, most of Malaya, with the exception of the colonial territories of Malacca and Penang, was under British protectorate, thus it was essentially still a multilateral agreement involving Britain. [5: LXIII] In a way, it was a case of *old habits die hard* for the Australian and New Zealand Army Corps (ANZAC) countries, since the agreements included British interests, but "Australia's commitment to ANZAM brought with it a sharpened sense of place in Southeast Asia and a policy of concentrating defence efforts in its neighbourhood." [6: 46]

ANZAM had two other important influences on the Royal Australian Navy (RAN). Firstly, on a strategic level, it designated anti-submarine warfare as the role of the RAN, something that was to shape and influence it for decades to come. [7: 28] Secondly, it initiated a high-level discussion between the RAN (on behalf of the ANZAM nations) and the United States Navy (USN). This liaison resulted in the Radford-Collins Agreement, which is a working level practical arrangement between the USN and ANZAM that also "predates the ANZUS (Australia, New Zealand, United States Security Treaty—author) agreement by about six months". [8] It is also interesting to note, that this agreement is still valid today, despite of all the geopolitical changes in the regions it covers, or the termination of ANZAM.

In the same year, the creation of NATO paved the way for more formal and inclusive defence treaties. In the SEA region, this culminated into the signing of the ANZUS treaty in 1951. In it, "the three signatories pledged to 'maintain and develop their individual and collective capacity to resist attack'." [9] It is interesting to note, that in this early 1950's security situation, the United States' policy was still more anti-colonial than what it would become only 3 years later. For this reason, Britain was not invited to join the ANZUS treaty. *Firstly,* inviting Britain would have opened the door to other European states with colonies still in Asia (that is mainly France fighting in Indochina). *Secondly,* in 1951 the British were very much bogged down in the Malayan Insurgency and the United States did not want to get involved in that conflict at all.

While the ANZUS treaty was not expanded to include Britain, another treaty was created which allowed it to contribute more to the joint security of the SEA region. By the mid-1950's, defence cooperation creation was in full swing around the world. In a year's time the Bagdad Pact (also referred to as METO) was created in Bagdad, and as a response to NATO the Warsaw Pact was signed in Warsaw including all Eastern Block European countries from Albania to the USSR. [10] The deteriorating security situation in SEA also called for a defence treaty, so "The South East Asia Treaty Organization (SEATO), formed in 1954 tried to do for Asia what NATO did for Europe." [11] Australia was one of the founding countries and SEATO played the major role in the country's foreign and defence policy until

the termination of the organization in 1977. After the creation of SEATO, Australia (and New Zealand, as well) took up larger responsibilities in the region, but it also has to be stated, that right from the beginning SEATO had many problems and limitations. These ultimately caused the demise of the organization, and in case of the defence of Malaya, it was not considered sufficient enough. For example, in a minutes entitled *Trends of Events in SE Asia* and dated the 14th of November 1954, Anthony Head, Secretary of State for War of the United Kingdom writes to UK Prime Minister Anthony Eden urging the swift creation of "a joint Australian, New Zealand, American and British planning organisation which can consider the whole situation and make proposals for stiffening up the defence of Malaya against subversion etc., in a cold war." [5: 80] The ink had barely dried on the SEATO agreement—signed on the 8th of September—yet one of the founding nation's Secretary of War already thought of a new organization to sufficiently deal with the Malayan situation. In a way, this notion can be considered behind the establishment of the Far East Strategic Reserve (FESR—also referred to as Commonwealth Far East Strategic Reserve) in 1955.

The creation of SEATO also coincided with the formulation of the so called *Domino Theory* by US Secretary of State John Foster Dulles. This theory significantly influenced Australian policy towards SEA for many decades. As far as the Malayan Emergency was concerned, however, it did not play such a major role, since Royal Australian Air Force (RAAF) units were already engaged in Malaya starting from 1950. On the other hand, it has to be mentioned that regular Australian Army units only entered the fray in Malaya after 1954 as part of a SEATO commitment. Thus, at least in a way, the *Domino Theory* not only lead Australia into the Vietnam War in the 1960's, but it also made the nation commit ground troops in Malaya.

With the signing of the formal ANZUS and SEATO treaties, it is clear to see how Australia's defence policy really shifted from Britain to the United States in the post-WWII era. They looked for protection from *Uncle Sam* rather than Her Majesty. This agenda later stayed as a major influence on Australian foreign policy, when the country joined American lead wars on terrorism, and it is still relevant nowadays.

The Outbreak of the Malayan Emergency

Before detailing the actual Australian units fighting the Communist insurgents in the Malayan jungles, one has to briefly mention the outbreak of hostilities, and why the actual conflict occurred in the first place. The social and economic background to the outbreak of the Emergency is a very complex matter to analyse that has filled numerous books. In many ways, the Malayan situation was very much like the Indochinese one at the time. Both territories had a Communist Party dating back to the late 1920's, a poor and dissatisfied population, Western colonizers, and charismatic leaders, in the person of Chin Peng in Malaya. Similarly to Ho Chi Minh in Indochina, who worked for the Allies against the Japanese in WWII, Chin Peng fought with British support in the Malayan People's Anti-Japanese Army (MPAJA).

The end of WWII in SEA signalled a certain change. Although Japan was bombed into capitulation by atomic and conventional bombs, most of the Japanese occupying forces in SEA stood undefeated. There were no victorious Europeans defeating them in the eyes

of the local nations, and this, coupled with the embarrassing defeats the European powers—mostly Britain and France—suffered at the beginning of the war changed the psyche of many Asian nations and the myth of European invincibility was lost. In case of the MPAJA, just like in case of the Vietminh, it was also important that their fighters had lived in the jungle for years and gained invaluable experiences in both small unit and guerrilla warfare against the Japanese. Following the end of the war, the MPAJA laid down most of its arms in December 1945, but significant number of weapons, ammunition and other supplies captured from the Japanese were hidden away in their base camps deep in the jungle. [12: 35–36]

Transition from guerrilla warfare to a peaceful political party was really daunting to most Malayan Communist Party (MCP) members and former MPAJA veterans. The smooth transition was further hindered when it was revealed that Loi Tak, the leader of MCP at the time, was in fact a double—or even a triple—agent, and the British Special Branch infiltrated the party leadership with him. [12: 38–41] After such a blow, the young Chin Peng, a distinguished fighter who received the Order of the British Empire for his role in the WWII took over the party leadership. Although he tried reforms, contacting international and neighbouring communists and raising support for Malayan independence, his toil produced only mixed results, and by the middle of 1947, the MCP leadership was leaning towards advocating violence in order to achieve their political aims. For this purpose, the Malayan Races Liberation Army (MRLA) was created as a military wing of the MCP. [12: 60] Reforms were tried by the British in Malaya with mixed results and following the murder of three European planters and their Chinese assistants on the 16th of June 1948, Edward Gent—Governor of the Malayan Union since 1946—declared a Federation-wide Emergency on the 18th of June 1948. The twelve-year-long armed struggle had begun that would officially last until 1960.

It is rather unique to Malaya that this aforementioned armed struggle was called an Emergency. High Commissioner Gent declared a state of emergency, not only because of the attacks on British interests, but because of British interests themselves. It was for insurance purposes that the whole war was officially referred to as emergency, and "the enemy as Terrorists, Communist Terrorists, or CTs. Most insurance policies would cover losses due to terrorism but had a clause precluding payments for damage caused by war." [13: 83] Thus it is clear to see and important to note, that the CTs themselves were not terrorists but insurgents. While there are some similarities between terrorist and insurgent warfare, they are still significantly different. [14] Although the confusing nomenclature by the British administration does not help the situation, efforts of the MRLA could not be considered terrorist in the modern sense of the word.

Australian Armed Forces in the Malayan Emergency

After the short analysis of the general political and strategic situation of the post-WWII world of SEA, the focus may now be turned to the actual Australian involvement in the conduct of military operations during the Malayan Emergency. For the sake of clarity, it is best to take a closer look at the Australian involvement in Malaya in a way that is divided into service branches. The Royal Australian Air Force, the Royal Australian Navy, and the Royal Australian Army, in the form of Royal Australian Regiments all contributed to the fight.

Australian Aerial Operations in Malaya

"The main characteristic of air forces in Malaya during the Emergency was the variety of its component parts." [15: 31] The air forces of three countries, the United Kingdom, Australia and New Zealand participated and they all used their own assets. It was also characteristic of the Emergency, that—due to its length and the technological advancements made in the 1950's —the variety of obsolete types were later gradually replaced by more modern ones, when the squadrons were re-equipped, and this was the case with the RAAF, too.

The first Australian force to arrive in Malaya were the contingent of the RAAF on the 19th of June 1950. These were the Douglas DC–3 Dakota transport aircraft of the No. 38 Squadron (Sqn.) from Richmond, New South Wales, which arrived at Changi, on Singapore Island, as part of the RAAF response to the Malayan Emergency. [16: 152] Due to the post-WWII downsizing of armed forces all over the world, the number of airbases on the Malayan Peninsula were limited, too. The main airbases of the Royal Air Force—the ones that RAAF assets used too—were RAF Tengah, Seletar, Changi, and Sembawang, which also served as a Royal Naval Air Station (RNAS). All of these were located on Singapore Island, while RAF Kuala Lumpur was in the state of Selangor, on the western side of the Malayan Peninsula, and RAF Butterworth was located in the state of Perak, on the north-western part of the peninsula, close to the Thai border. These were the airbases that could accommodate larger transport and bomber aircraft, as well as jet fighter-bombers. As the Emergency went on, a large number of smaller, auxiliary airfields and landing strips, as well as helicopter landing zones were created, but RAAF aircraft did not use these, due to the types Australians used, which were not suitable for such airfields. All of the RAAF units were officially integrated into the British Far East Air Force (FEAF), but they were part of the No. 9 (Composite) Wing, as to avoid individual squadrons being placed under British command. [16: 153]

As far as the types of missions were concerned, RAAF squadrons were engaged in offensive air support, immediate air support—or as it is also called: close air support—medium range transport and last but not least, psychological warfare operations.

For medium range transport mission, the RAAF used the aforementioned Douglas Dakotas of the No. 38 Sqn. only. These WWII-vintage aircraft stayed in Malaya until December of 1952. When they were finally withdrawn, they had flown 1829 tons of supplies, airdropped 805 tons and carried over 17,000 passengers. [16: 153] Furthermore, they showed a serviceability of 84% in 1951–1952, which is a testament of not only the reliability of the venerable old Dakotas, but also to the professionalism of the Australian ground personnel, who had to keep them flying in less than ideal climate. [15: 77]

The air transport need of the operations obviously were not covered by RAAF assets solely, and the RAF operated three dedicated transport squadrons while the Royal New Zealand Air Force (RNZAF) also contributed a flight of Dakotas from their No. 41 Sqn. It is interesting to note that, owning to the re-equipment with new aircraft, the medium range transport capabilities of the fighting forces got depleted by the end of 1951. No. 21 (RNZAF) squadron was withdrawn to New Zealand to re-equip with Bristol Freighter aircraft, and the RAF squadrons were experiencing serviceability issues with their new Vickers Valetta C.1-s, thus the Australian Dakotas, with their excellent serviceability rate, had to compensate for this reduced capability. [15: 76]

Transport capabilities were in huge demand also because supply droppings were essential for the platoons on jungle patrol. "Drops to individual platoons are [were] quite normal and are [were] carried out with clockwork regularity and precision", writes Brigadier Francis H. Brooke in 1954, who served in Malaya, and would later become the first General Officer Commanding the Malayan Federation Army. [17: 16] Also adding that the "whole process is [was] so good that the infantryman tends [tended] to take it for granted. Indeed, the complete dependence on air supply is [was] the finest, if silent, tribute to the Air Forces." [17: 16]

For offensive and immediate air support, altogether 4 RAAF squadrons served in Malaya. These were No. 1, No. 2, No. 3 and No. 77 squadrons, but regarding the lengths of the deployment and the actual tonnage of bombs dropped, No. 1 stands out from the rest of them. The No. 1 Squadron of the RAAF joined Operation Firedog, the Royal Air Force (RAF) campaign against Malayan communist insurgents in July 1950, a few weeks after the Dakota squadron. [18: 83] It was one of the three RAAF units equipped with the Avro Lincoln, a heavy, four piston-engine bombers developed in 1944 from the Avro Lancaster used extensively during WWII. Its categorization from *heavy* was changed to *medium* after 1945, but nevertheless this was the largest bomber at disposal at the time for both the RAF and the RAAF. It could carry 6,800 kilograms of bombs, and in the low threat aerial environment of Malaya, where there was no enemy air force to encounter, and no real anti-aircraft-artillery, their age and lack of speed did not matter. The RAAF Lincolns were loved by their crews, and they had by far the highest serviceability rate of any of the attack aircraft, "in excess of 70 per cent—considerably higher than that of their Canberra replacements." [15: 31]

In the course of their operation, they were employed in level bombing as a harassment of insurgents in the jungle, usually with standard 500 lb and 1000 lb bombs. However, "4000 lb block-buster bombs were also dropped by the Aussie Lincolns, the idea being that one such bomb should clear an area in the jungle enough for a helicopter to land." [18: 83] This practice, like many other experiences of Malaya, was later taken over by Americans in the course of the Vietnam War. Target marking, in a very similar way to that of the Vietnam War a decade later, was also employed in Malaya. Crews experimented with several types of target markings, "but the most successful for day ops proved to be smoke flares dropped by low-flying Austers [Taylorcraft Auster observation aircraft—author], a highly specialized task carried out by pilots operating under the most difficult conditions." [18: 83] These could be considered forerunners of the Forward Air Controllers (FACs) of the Vietnam War, as the theory was the same behind the action. As far as the actual bombing technique was concerned, it was also conventional, with aircraft flying in *vic* formation, dropping their load of 10 × 1000 lb general purpose bombs at one second intervals, or sometimes simultaneously. [18: 84] However, operations in Malaya certainly could not be considered a piece of cake for the aircrews, as they had to maintain close formation flying for up to four hours, missions were flown day and night, in tropical weather and scorching heat.

Due to the terrain there were triple canopy jungles where the target could not be seen, therefore this level area bombing operations could seem like a waste of resources, but the results showed differently. According to captured insurgents, the harassment of the Lincolns, and that of the air forces in general, it was really effective, and even Chin Peng, the head of the MCP almost lost his life because of one such raid in 1953. [19: 51] Indeed, during the conflict, the value of offensive area bombing operations was demonstrated frequently. For example, in Operation Kingly Pile on the 21st of February 1956, which was

a joint strike at a CT (Communist Terrorist, as the British called the insurgents) camp in the State of Johore, RAAF Lincoln and RAF Canberra bombers completely destroyed the camp of the 7th Independent Platoon of the MRLA, killing 22 insurgents, including Goh Peng Tuan, their commander. [20: 76] In their first year alone, RAAF Lincolns of No. 1 Sqn. dropped around 2,500 tons of bombs, both by day and night operations, in flying 744 sorties and 3,303 operational hours in all weather. [18: 85] In the almost 8 years of continuous operation, the RAAF Lincolns dropped almost 17,500 tons of bombs, which amounts to 85% of the total tonnage dropped by all aircraft in Operation Firedog. [18: 87]

Along with conventional bomb dropping, the Lincolns also participated in training, leaflet dropping psychological warfare operations and SEATO exercises. Thanks to the low threat environment, the good reliability and the level bombing conduct of operations, only two Lincolns were lost during their deployment, and none of those due to enemy action. [16: 153] Although, with the arrival of the Lincolns after the Dakotas, RAAF aircraft were part of the No. 90 (Composite) Wing as a parent unit, air operations came under the overall control of the Commander-in-Chief of the Far East Air Force (of the RAF, previously called Air Command Far East), while the actual operational control was exercised by the Air Officer Commanding Malaya, who was in turn subordinate of the High Commissioner. [20: 65]

The offensive air support role of No. 1 Sqn. was taken over by No. 2 Sqn. of the RAAF in June 1958. This opened a new chapter in the logbook of the RAAF, as the Canberras were jet powered, and the first bombing sortie flown on 3 September 1958 marked the first jet bomber mission ever for the RAAF. [16: 154] However, the Emergency was winding down by that time, the Briggs Plan worked in winning the hearts and minds of the population under the implementation of Sir Gerald Templer, High Commissioner of Malaya between 1952 and 1954, and the insurgents were pushed to the Thai border areas. Thus, the Canberras only saw limited action compared to their forerunners, the Lincolns. [15: 47] They flew the last bombing sortie in Malaya in January 1959, but No. 2 Sqn. could not have known that in the following decade, they were to see intense action again in SEA, at that time aspart of the Australian forces fighting alongside the United States in the Vietnam War. The squadron stayed at Butterworth airbase even after the end of the Emergency, as part of the Strategic Reserve forces until early 1967, when they redeployed to Phan Rang in South Vietnam. [20: 78]

Compared to the reliable Lincolns, the high-tech jet Canberras also had a much lower serviceability rate due to their complexity. As far as jet bombing techniques were concerned, the Canberras flew both day and night missions, but the close *vic* formation of the Lincolns was changed to line astern flying, with larger gaps among the aircraft during the night. [15: 59]

The other two RAAF squadrons for offensive operation were No. 3 and No. 77 both flying the Commonwealth Aircraft Corporation (CAC) Sabre jet-fighter, an Australian license built and modified version of the North American F-86 Sabre, used to great effect in the Korean War by the United States Air Force. They were deployed to Malaya, RAF Butterworth together with the Canberras, and due to the Emergency winding down, they, too, saw little action. No. 3 deployed there on the 1st of July 1958, while No. 77 arrived as late as 1 February 1959. [15: 47–48] They still managed to fly some sorties though, the first taking place on 13 August 1959. [16: 154] Along with the Canberras, both Sabre units were part of Australia's SEATO contribution too, and they were also part of the Commonwealth Far East Strategic Reserve (commonly referred to as the Far East Strategic Reserve [FESR]). Their role in FESR would be more significant later, as Australian Sabres provided protection

for Malaya during the *Konfrontasi* with Indonesia a few years later. The CAC Sabres also found their way into the hands of the newly created Royal Malaysian Air Force as a gift between 1969 and 1972. [21] Under the umbrella of FESR, Australian squadrons were regularly based at Butterworth airbase until the disbandment of the RAAF's No. 79 in 1988.

Next to offensive and transport operations, RAAF air assets also took part in psychological warfare operations in Malaya. However, most of these operations, which included leaflet dropping and broadcasting messages via loudspeakers on low flying aircraft, were conducted by the RAF. Occasionally, RAAF Dakotas and Lincolns also dropped leaflets, most notably on 3 August 1950, when No. 38 Sqn. Dakotas, along with other RAF aircraft, dropped 103,000 leaflets over Communist held territories. [22: 30] The Dakotas also occasionally served performing the role of casualty evacuation and weather reconnaissance, but these roles were mostly fulfilled by RAF aircraft, just like all the other roles of air operations in Malaya not mentioned here in an Australian context. These include helicopter assault, search and rescue (SAR), maritime reconnaissance, strategic reconnaissance etc. missions that were all the responsibility of the RAF and not the RAAF.

Australian Ground Operations in Malaya

Combat operations for Australian ground units started only in a relative late stage of the Emergency. Australian soldiers had been involved in the training of British soldiers in jungle warfare, even before Royal Australian Regiment troops set foot on Malayan soil. In fact, by 1952, when the Brigg's Plan was starting to show its results under the direction of Sir Gerard Templer, at least part of the success was "attributable to the excellent training they [the British soldiers—author] received at the Far East Land Forces School of Jungle Warfare in Johore, where most of the instructors were tough and experienced Australians, who had fought in New Guinea." [20: 45]

As the SEATO talks were going on in the background, and ANZUS did not include the UK, Britain tried to strengthen its relationship with Australia and New Zealand again. Sir John Harding, Chief of the Imperial General Staff was sent by the Churchill Government to discuss defence issues in SEA, and in October 1953, "Harding informed Australia and New Zealand of Britain's intention to strengthen the ANZAM agreement, and to form a Far Eastern strategic reserve for the defence of Malaya." [23: 3] This process continued at the Commonwealth Prime Ministers Conference in 1955, and on 1 April 1955 Prime Minister Menzies announced that Australia was going to participate in the Commonwealth Strategic Reserve, which was "established for the defence of Malaya, and is also available for use in operations against the Communist terrorists." [24: 233]

As a result of this commitment, one battalion of the Royal Australian Regiment (RAR), and a battery of Australian artillery was deployed at a time, on a rotational service. The 1st, 2nd and 3rd Battalion of RARs all served in Malaya. They were all part of the 28th Commonwealth Infantry brigade together with British units, and a New Zealand engineering squadron. [20: 54] The foremost RAR to arrive in Malaya was the 2nd, together with the 105th Medium Battery of the Royal Australian Army (RAA) in September 1955, but 2 RAR (2nd Battalion, Royal Australian Regiment) did not start operations until the 1st of January 1956. [25: 222] They were nominally stationed at Minden Barracks, in the State

of Penang, but it was rare that they were there to be found, as most of the time they were engaged in operations. [22: 11]

The Australian contribution in the Malayan Emergency also illustrates how big a role the country took in SEA affairs, something that lead to Australia's involvement in the Vietnam War, as well. Every RAR in Malaya was given an area of operations with an allotted target. These were one or more organized groups of CTs. The CTs had a known area of operation, and these were the determining factors in the establishment of operation boundaries. [26: 25] The first action for 2 RAR was Operation Deuce, a search and security operation in the state of Kedah, at the Thai border of the peninsula. The operation ended on the 30th of April, when 2 RAR handed over the responsibility of the area to the 1st battalion of the Royal Malay Regiment. [22: 11]

The next operation 2 RAR participated in was Shark North, starting from early May in the State of Perak. In the end, this turned out to be the most intense operation Australian forces participated in during the entire Emergency. On the 22nd of June, a patrol was ambushed by CTs, the firefight drew other Australian units into the fight as well, but the communists managed to escape into the jungle, leaving 3 dead and 3 wounded Australians behind. [22: 11–12] 2 RAR suffered further 2 casualties almost a year after the first occasion on the 24th of June 1957. This time, they discovered a large communist camp, and in the subsequent firefight with its inhabitants, suffered two killed and one wounded. [22: 11–12] This amounts to five killed in action in one year for 2 RAR, which is 38% of all casualties suffered by the Royal Australian Army during the Emergency. [27] 2 RAR was withdrawn from operations in August that year and left Malaya in October.

The previous unit of Australians was replaced by 3 RAR from September 1957, although they only started operating after a training period on the 1st of December 1957. [22: 12] Just like the first unit, they too were supported by an artillery battery on a deployment. This time it was the 100th Field Battery, also called the "A" Battery of the RAA. [25: 222] 3 RAR was based at Minden Barracks as well, and their first operation was Shark North, a search and security mission, the one that 2 RAR took part in previously. 1958 opened with Operation Ginger for 3 RAR, which covered an estimated area of 3,100 square kilometres in Perak, and they were in search of 170 elusive CTs in the jungle. In the end, the battalion pursued the CTs on until they crossed the Thai border, where they could no longer follow them. When it was finished, Operation Ginger was considered a success, as the State of Perak was declared a safe area in 1959. [25: 222] 3 RAR departed from Malaya to Australia in October 1959.

The place of 3 RAR was taken over by 1 RAR on Malayan soil. The unit previously fought in Korea, which they left in March 1956. They had also received jungle warfare training at Kota Tinggi, before starting combat operation on the Malayan Peninsula. [28] Their supporting battery was the 101 Field Battery of the RAA. [25: 222] 1 RAR's first mission, Operation Bamboo took them to North Perak, near the Malayan–Thai border, basically where the previous unit left off. [20: 62–63] "During the next two years the battalion was on patrol on the Malaya/Thai border spending weeks at a time searching and laying ambushes." [28] Their activities included participation on Operations Magnet and Jackforce in the same area as before, right until Malayan Prime Minister Tunku Abdul Rahman declared the Emergency to be over on 31 July 1960. However, 1 RAR's deployment did not end then, since they were deployed as part of the FESR, and stayed in Malaya until 29 October 1961. [22: 11]

Altogether, the Australian Army suffered 13 killed, 24 wounded in action. Together with the losses of the RAAF, Australia lost 15 men, and a further 27 were wounded in operations. [27]

Australian Naval Operation in Malaya

The Royal Australian Navy's (RAN) operation in Malayan waters began with the ANZAM agreement in 1948, but actual missions against the communist insurgents only commenced after the establishment of the FESR in 1955. Ever since, the RAN maintains a close relationship with its Malaysian counterpart. The directive of the FESR, as part of the *forward defence* strategy gave two roles for the RAN. Its primary role was to act as "a deterrent to further Communist aggression in South East Asia", together with units of the Royal Navy. In an event of full scale war, it would have served in the defence of Malaya, Singapore and the sea lines of communication around those. Their secondary role was "to assist in the maintenance of the security of the Federation of Malaya by participating in operations against the Communist Terrorists." On paper at least, these were the roles, but in practice, the secondary role was to dominate RAN operations in the late 1950's. [29]

As far as the command of RAN ships was concerned, the naval directive of FESR "transferred operational control of RAN ships deployed to the Far East Fleet to the Royal Naval Commander-in-Chief, Far East Station, and stressed the supremacy of the General Directive [of FESR—author]." [30] According to the naval directorate, RAN ships were deployed on 9 month long cruises, with the exception of Her Majesty's Australian Ship (HMAS) Melbourne, which only had 2 month long deployments at a time. [31: 57]

The first RAN units to arrive on station in Malayan waters were HMAS Arunta and Warramunga in June 1955, but their deployment was only 6 months long in the beginning. "They had been involved in exercising, patrolling the waters offshore of the Malayan Peninsula, and training with Malayan and Singaporean marine forces, but were not required to fire on enemy positions." [32: 52] The role of naval forces in a counterinsurgency (COIN) war, especially when the enemy is hidden in the jungle, seems to be very limited, but RAN ships still played an important role, even when they were not firing their guns in anger.

First and foremost, "it should be noted that the effective naval blockade against the supply of arms and ammunition to the CTs from sources outside the country denied them any effective use of the sea throughout the Emergency." [29] Chin Peng stated that "We didn't receive any outside aid […] not even a bullet", but this is an ambiguous statement and his forces did receive some supply from Singapore. [33: 192] Although there is no discovered evidence up to this date showing that a foreign power tried to resupply the MRLA, the deterring factor of the naval blockade must have played a part in that. The significance of this role comes to light especially when compared to the other major war in SEA, the Vietnam War. Complete naval blockade could not be established there, and insurgents in the South were resupplied from the North. Looking at the map of the Malayan Peninsula, it is also easy to see, that maintaining a complete naval blockade at such a long coastline was indeed a major achievement. *Secondly,* the strong naval presence, this traditional *show of the flag* was an important part of the British *hearts and minds* campaign aimed at strengthening Malayan

resolve against the communists. [7: 29] *Showing the flag* was especially vital for the Malayan administration on the more remote, and less populated eastern part of the peninsula, which were far away from the central administration.

Altogether, the RAN deployed 13 warships on 35 tours of duties over the course of five years. For the sailors, "two tours were common, with three or four deployments by individuals by no means unusual, with some serving in more than one ship over the five-year period." [30] As far as the number of service personnel is concerned, the naval contribution to Malaya "would amount to some 1,500 personnel annually […] although the former figure included the 1,000 men for the regular visit of the carrier and it's embarked squadrons." [29] The 13 ships were: HMAS ANZAC, Arunta, Melbourne, Quadrant, Queenborough, Quiberon, Quickmatch, Sydney, Tobruk, Vampire, Vendetta, Voyager, Warramunga. From these, Arunta and Warramunga were Tribal-class destroyers, Quadrant, Queenborough, Quiberon, and Quickmatch were Q-class destroyers, Tobruk and ANZAC Battle-class destroyers, and all were World War II veterans. [34: 6] The Q-class ships were serving with the RAN only since 1950, after that they were given as presents from the RN to the Menzies government. [35: 34] Newer designs were HMAS Vampire, Vendetta and Voyager of the Daring-class and these later saw service both in the *Konfrontasi* with Indonesia, and during the course of the war in Vietnam. [36]

HMAS Sydney, the Majestic-class light aircraft carrier, which served with distinction in the Korean War, never fired a shot in anger in Malaya, but visited ports in SEA as a projection of force and participated in SEATO exercises. She was decommissioned as an aircraft carrier in 1958, and her conversion to a troop carrier was finished only after the Emergency was over in 1962. [37] As with many RAN assets, she went on to play an important role for Australia in the Vietnam War. The other aircraft carrier and subsequent flagships of the RAN after her commissioning in 1956, HMAS Melbourne had a similar service as Sydney. The ship sailed in Malayan waters and participated in numerous SEATO exercises—including exercise Ocean Link, a huge undertaking with 24 ships and submarines from five nations participating—but she never fired a shot in anger. [38]

At the time of her deployment in Malayan waters, Melbourne possessed impressive capabilities. She had an angled flight-deck, steam catapult and mirror landing aid-built in. [39: 6] The De Havilland Sea Venom all-weather radar-equipped interceptors were the first of their kind in the Southern Hemisphere, and the Fairey Gannet anti-submarine-warfare aircraft could be used to maintain a naval blockade. However, her impressive capabilities were simply not required anymore, as the Emergency was winding down, and the land-based air assets were sufficient for the limited intensity conflict. The real offensive part played by the RAN in Malayan waters was Naval Gun Support (NGS), which took place on five occasions between 1956 and 1957, when RAN destroyers undertook such actions. As long as CT elements were operating close to the coast, naval bombardment was an effective and, more or less, stealthy way of disrupting them. [33: 194]

According to Pfennigwerth, the RAN, although participated in the fighting, it did not learn much from these operations. He states that "despite the demonstrated utility of inshore patrol craft during the Emergency, the RAN procured none that could be deployed either to Confrontation or to Vietnam when this kind of contribution was called for." [33: 195] This was indeed backward thinking, since, for example, the United States learnt from the lessons of the French in Indochina in *brown water* naval operations and procured small crafts that

were suited for such missions. Pfenningwerth explains this by writing "that RAN eyes were on the main game—defence of Southeast Asian sea lines of communication—rather than on the naval sideshow that anti-CT operations in Malaya were." [33: 195] This indeed sounds like a possible explanation, since RAN did gain experience in other ways, but not in riverine warfare.

The role of RAN did not end in Malaya with the declaration of Malayan Prime Minister Tunku Abdul Rahman on the 31st of July 1960. The RAN helped in the establishment of the Royal Malayan Navy, still stationed ships in the country as part of FESR, and even trained Malayan reserve units. For example, right after the end of the Emergency, HMA Ships Quiberon and Vendetta were both training Royal Malayan Naval Reserve cadets, while also *showing the flag* and visiting Malayan ports. Furthermore, RAN provided many officers for the new navy until Malayan officers were trained in sufficient numbers. [40: 32]

In the end, the RAN did not lose one single person due to enemy action, only 4 sailors lost their lives in accidents, and 43 others got injured, while the ships were in Malayan waters. Altogether, the Australian services suffered 15 killed in operation, and 27 wounded. The non-operational casualties were higher, with 36 fatalities, and 172 wounded. Approximately 7,000 Australian servicemen served in Malaya from all services. [27]

Conclusion

The Australian experience in Malaya was a fairly successful one. It was the first limited armed conflict the nation took part in since the Boer War, and also the first time when Australia participated in a war on its own. Considering the number of servicemen, it suffered relatively low casualties, while also gained invaluable experience in new warfare methods, something that was to come handy in the next decades. COIN experts consider Malaya a model of a successful COIN war, something that is indeed very rare in the course of history. It is also regularly contrasted with the Vietnam War, firstly because of the many similarities, and secondly, because of the difference in British effort compared to the American one. The United Kingdom indeed spent significantly less resources and still won the struggle, but as it is illustrated on these pages, it only managed to do so with the help of Australian, and also New Zealand forces, which also contributed to the FESR, but their effort is not analysed here. Finally, Australian participation in the Malayan Emergency is also interesting to analyse as it came at a time, when Australian foreign policy experienced its greatest shift, something that is still influencing Australian policy decision.

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Fire, Rescue, Disaster Management. Experiences from Different Countries[1]

Péter PÁNTYA[2]

On international level we can find various methods in the field of fire and disaster management interventions. Individual nations are trying to manage the activities related to firefighting, technical rescue, and, in some cases, healthcare on the basis of international trends but individually and at the highest quality possible.

In this article, the author intends to present some syntheses of information that have already been published about the differences and some good practices of rescue organisations applying common, basically similar tools by taking an international outlook and studying various countries—including Hungary. The target countries are in Europe: Poland, Germany, the United Kingdom and Italy.

Keywords: *fire, rescue, disaster management, experience, international*

Introduction

In order to be able to make an accurate evaluation of national organisations, disaster management and firefighting forces carrying out primary response as well as their effectiveness and development potential from the viewpoint of fire protection operations responsible for the protection of the lives and properties of the population, it is necessary to take a look at similar activities of other nations. [1]

To start with, it is important to point out the fact that the protection and rescue of a citizen or a person passing through the country, the need to intervene in a fire or a road accident are based on almost the same grounds all over the world. The differences can be spotted in the national development potentials, the adaptation of international best practices, in minor variations, mind sets and traditions. In order to discover all these development potentials and best practices and to examine their adaptability, the author has launched a research at the National University of Public Service, Budapest, Hungary under the Zrínyi Miklós Habilitation Program. With the help of the findings gained through research, this paper describes and compares fire protection activities—providing the basis of the research—at national and international level. Some of the results of my research in this field have already been published before in Hungarian. The already finished synthesis will be published in this paper on an international level.

International outlooks require a correct analysis of the data, not just a dry review of the figures but also considering the differences in fire-, technical rescue- and disaster management-related risks. [2] Firstly, the current environment in Hungary is described along with organisational, technical and procedural characteristics responsible

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for protection, which is followed by a description of circumstances and activities in other countries—relevant to the research. These countries are the United Kingdom, Germany and Italy. The description of individual countries may include smaller details of professional interest, though of seemingly less scientific importance. The purpose of this paper is also to disseminate knowledge among those interested.

In this paper, the international outlook will also pay due attention to the difference that in several countries around the world fire service and disaster management provides, ambulance service, as well. Best practices and solutions which can be considered for adaptation are presented in the conclusion, at the end of the paper.

Hungary and its Fire Protection Operations

Hungary's territory is 93,030 square kilometres; its population is 9,877,365 (based on 2014 data) and it has the 58th largest economy in the world (based on 2015 GDP[3] figures). In Hungary, fire protection operations are primarily a public task. [3] The professional disaster management organisation, or in a short and a more comprehensive interpretation of the activities, disaster management is responsible for the related activities such as primary response, firefighting, technical rescue and disaster response.

The professional disaster management organization is divided into national (National Directorate General for Disaster Management—NDGDM), regional (county disaster management directorates, the Disaster Management Training Centre and NDGDM Economic Supply Centre) and local organisational levels (disaster management branch offices, professional fire brigade headquarters and their posts). The total number of the professional staff is 11,451 (1 July 2016), out of which this paper can take into account approximately 8,000–8,500 professional firefighters directly involved in fire operations. [4]

The interventions at the operational level are primarily performed by professional fire brigade headquarters (conventional and special fire engines with staff on duty) and some organizational elements of county disaster management directorates (county operations control, mobile laboratory and operations management service).

The intervention activities of the professional disaster management organisation are assisted by additional fire brigades of different legal statuses. They include municipal, industrial and volunteer fire brigades with similar equipment. [5]

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[3]   Gross Domestic Product, an economic indicator.

Picture 1. *Joint training of the disaster management, fire, ambulance and prison guard services in Hungary, 2015.* [Author's own photo.]

It should be noted that the country has two urban search and rescue (USAR) organizations. They are the heavy-category, professional HUNOR and the medium-category HUSZÁR consisting of typically volunteer members.

The total number of deployments of professional firefighters, municipal and industrial fire brigades as well as volunteer firefighters' associations between 2011 and 2015. (Table 1.)

Table 1. *The total number of deployments of professional firefighters.* [4]

Period (year)	Number of deployments (pcs)
2011	69,828
2012	69,392
2013	55,444
2014	57,264
2015	59,860

Given that the international outlook in this paper is basically intended to highlight differences from Hungary, it assumes a minimal knowledge of this system, therefore the Hungarian aspect will not be explained in more details.

Poland: Training Possibilities for Fire Protection Operations

In Poland the fire protection higher education centre is in Warsaw. It is called the Main School of Fire Service[4] which is also the central fire protection university in Poland. The author has already visited a lot of fire departments, training centres all over Europe and outside the European Union, as well. In Poland there are some good practices in the area of training firefighters and future fire officers.

Two ways can be interesting to mention, the first is the practical way. The Main School of Fire Service has a central education building complex in the heart of Warsaw. For special practical trainings, they have a training ground in Zamczysko with real fire circumstances.

Picture 2. (left) and 3. (right) *Containers of fire equipment in Zamczysko ready for drills and a fire chamber belonging to the network of containers for real fire trainings, 2015.* [Author's own photo.]

This training ground is in a forest, far from the capital and other cities. During the first period of the education, the students of the university live here for months in order to socialize them for the fire service and support them with a wide range of fire skills.

Picture 4. (left) and 5. (right) *Roof training scene to get movement and cutting skills and targets to get fire hose control skills 2015.* [Author's own photo.]

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4   In Polish: Szkoła Główna Służby Pożarniczej.

The second way can also serve as a good practice in the issue of training fire officers which was initiated in 2017 by decision makers in Warsaw, at the Main School of Fire Service.

The best way to make freely modified circumstances realistic is using computer technology. Situations can be displayed on a big screen like in a computer game. The fire officers (incident commanders) during the training are doing their normal tasks by radio and the impact of their decisions can be immediately seen on the screen by the operator.

Picture 6. (left) and 7. (right) *The decision maker training room with the operator and his workplace, in the background there is the place of the trained incident commander, 2015.* [Author's own photo.]

The operator due to the drill tasks can change the place of the incident (e.g. city, motorway, forest), the weather (summer, winter, snow, fog) and also the time (be it day or night). The displayed moving of the firefighters and engines are like in real life, with real speed.

The using costs of the incident commander simulation room is very low and there can be built any kind of accidents or disasters. Several kinds of intervention team leaders can be trained here not only fire service officers; it can also be used by the police and ambulance.

The United Kingdom and its Fire Protection Operations

The United Kingdom has a total area of 244,820 square kilometres, with a population of 65,102,385 (based on 2016 data) and it has the world's 5th largest economy (2015 GDP figures). [6] The total number of deployments of firefighters between 2011 and 2015. (Table 2.)

Table 2. *The total number of deployments of professional firefighters.* [7]

Period (year)	Number of deployments (pcs)
2011	288,000
2012	272,800
2013	192,700
2014	212,500
2015	191,647

Organisations in charge of fire protection operations (Fire and Rescue Service) operate under different regulations and foundations in Scotland, Wales, Northern Ireland, and England. The concept of a volunteer fire service is different from the one used by us, it rather refers to part-time firemen, who are paid in proportion to the time spent on job, as it is also shown in their name. There are more than fifty professional fire brigade organizations in the country, and the equipment and activities of fire engines are similar to those in Hungary.

In order to find various operational issues and good practices available, personal consultations were carried out with a variety of firefighters. From the professional conversations, the following—occasionally uncategorised—knowledge can help you get to know the UK firefighter intervention area.

For a variety of reasons, the number of people in the fire brigade responsible for Liverpool and its vicinity has decreased. The fact that the number of the staff fell to less than its half over the past twenty years is likely to aim for a more effective organisation and a higher-quality fire protection, although we cannot ignore possible demands from the supervisor to reduce expenses. The high workload, the tight responsibilities (in addition to the intervention activities) could be clearly observed during the research. Schedules typically consist of four shifts of twelve hours, but in some cases, we can find different examples. In London, day shifts last nine hours, while night shifts last fifteen hours, with changes at 9 a.m. and 6 p.m.

As regards the technical conditions of the interventions, the masks of the respirators are cleaned and maintained by the firefighters using them. During the change of shift, common, complete tests are carried out on all devices kept on standby on the fire engines along with the telemetry.[5]

The training and further training of firefighters is clearly separated into five key areas, which need to be repeated every two years. These are road interventions, alpine techniques, working at height, use of breathing apparatus and smoke chamber, water interventions as well as dangerous substances. The alpine techniques training is provided to all firefighters even at basic training, with standard equipment available on all fire engines. It is important to note that the harness straps are also available on fire engines.

Basic health care training is also part of the various training courses. However, some reluctance can be observed among firefighters (in several countries) to provide (occasionally obligatory) health care assistance, which is basically emergency service, given the differences in the attitudes of the two fields and that their basic activities themselves (firefighting, technical rescue) are physically very demanding and less sterile (smoke, soot, oil, dirt).

As regards handheld devices used in interventions, it can be said that modern technology can often help the work in certain fields, but in some cases simple and effective solutions turn out to be the best ones. Special forcible entry tools (hooligan tools) are standardised equipment on certain fire engines. It is similar to the force bale standardised in Hungary, perhaps with fewer functions, but with higher efficiency in its main activities (e.g. opening doors and windows). To make interventions quick and easy British firefighters are also assisted by manual window cutting saws. Still about simple, quick and low-cost equipment, one

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[5] A radio communication-based remote monitoring system, whose purpose is to monitor the safety of the firefighters, more precisely, their air consumption, volume, expected operation time and other safety factors.

standardised on all fire engines and listed in all intervention regulations is the highly durable, colour-coded protection film (manufactured by Packexe). Attached to the windscreens of vehicles or any other glass surfaces and then cut around, the glass surface can be safely removed and the sharp edges of cut metal surfaces can be made safe. Quick technical rescue and entrance is also supported by electric, battery-operated angle grinders, hand saws and mobile lighting systems, all standardly available on fire engines. Hoses are coupled together in a way other than the Storz standard widely used in Europe, but no significant difference in efficiency can be detected.

Picture 8. (left) and 9. (right) *Electronic spreader-cutters and highly durable, colour-coded protection Packexe film in a fire engine in Liverpool, United Kingdom, 2017.* [Author's own photos.]

In addition to the conventional hydraulic spreader-cutters, new electronic innovations have been introduced in recent years by manufacturers. At the 2011 Interschutz International Exhibition for Rescue, Fire Fighting, Fire Prevention, Disaster Relief and Security, only one out of ten rescue sets were electronic, but by now the rate has reversed and there are much fewer ones with traditional, combustion engines. Despite some of its disadvantages (for example, limited battery life, slightly larger weight), there are significant advantages when it comes to their practically unlimited mobility and their freedom from hoses. British firefighters have accumulated many years of experience in the daily use of electronic rescue sets, which are considered to be rather useful. According to the information gathered during consultations, the devices worked properly practically in every situation and they offer about twenty minutes of battery operation time (continuous operation). With the additional batteries stored on the fire engines and the built-in chargers, a near-continuous operation can be guaranteed.
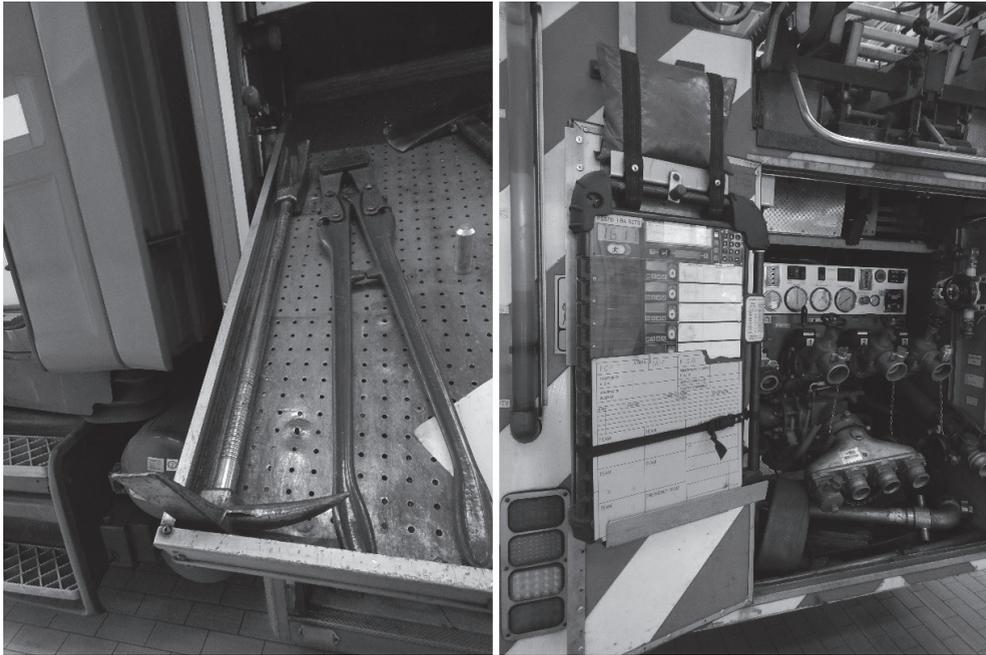
Picture 10. (left) and 11. (right) *Halligan bar and Draeger Merlin telemetry system in a fire engine in Liverpool, United Kingdom, 2017.* [Author's own photos.]

The telemetry remote monitoring system mentioned earlier—intended to monitor the use of the breathing apparatus and the safety of the interveners—includes the entry control board keeping track of the wearers having entered the closed, smoke-filled space (at Merseyside Fire and Rescue Service, products of the safety technology company Draeger are used, such as the Merlin board). Each fire engine carries one and they are checked at shift changes. It is handled by the person appointed by the on-site incident commander, who is most often the driver of the fire engine.

Each fire engine in Liverpool is manned by four people (one driver, one commander, two intervening firefighters), which may seem few, but good firefighting coverage and short travel times can ensure timely help from supplemental firefighter units. The so-called *start* systems ensure a higher level of preparedness to the engines themselves at fire stations, similarly to other countries. They continuously charge the batteries and keep the cooling water warm, but the air tanks of the brakes are not filled (contrary to several examples in Hungary). Fire engines and their compartment doors can be opened and locked centrally with a hidden switch.

Taking a step back from the local operative level, we can find further background support facilitating the safety and efficiency of the interventions. Declared procedures followed by the staff as intrinsic motivation, cooperation among those involved in emergency rescue (fire service, ambulance service, police) aim at a common goal. Cooperation will always be on the same level, similarly to the procedures in other countries. [8] [9]

After some of the higher priority incidents, consultations are carried out between the interveners and local officers to draw the consequences and to avoid possible mistakes in the future. One of the core activities of the commanders, officers is the continuous development of the staff they are in charge of. Negative retaliation is typically not used towards firefighters for mistakes, the goal of trainings and further trainings is to become more and more efficient in performing their tasks. Subsequent analyses of cases are aided by on-board camera systems installed on each fire engine, which preserve recordings from cameras on all four sides of the engine for several hours. Safety is of utmost importance (a frequently expressed slogan is *safety first*). Recent cases posing threats (such as a damaged part of a fire helmet, what was in use on the engine) are addressed and published in special information circulars.

Picture 12. (left) and 13. (right) *Mobile Data Terminal and its thermal printer integrated in a fire engine, Liverpool, United Kingdom, 2017.* [Author's own photos.]

At present there is no fire bike service in Liverpool, but earlier these vehicles used to allow fast arrival, reconnaissance and early steps to be taken. In any case, they are worth considering based on these examples and experiences.

A rather good practice is the analysis and data collection department with a fairly sizeable staff of civilian employees (about twenty employees in Liverpool). They also support fire service, civil protection and authority tasks, as well. Data from local governments are continuously collected and entered into a database. Operations control relies on this data (emergency calls to 999 are directed here, answered by fire officers) and it is available on on-board computers on every fire engine. They have information about the residents in each building, about different social problems in certain neighbourhoods and about people with disabilities. A separate department with similar operation and number of staff is responsible for technical data collection, gathering information about roads and their temporary closures, the condition of buildings, utilities and services. Upon request, the police may also receive information, in addition to the incident commander on the spot or even during travel to the incident. At the time of the alarm, all basic information available are accessible to the incident commander through the on-board computer, but he may also receive SMS messages with further information he requires. They now have ten years of experience in collecting and forwarding background information. Long-term

use has proved this kind of background support rather effective. Connecting a printer to the on-board terminals allows printing and handing out hard copies of data, maps and site plans, which has proved to be a good practice.

During the recruitment process to the fire service—similarly to other countries—there are several rounds. The first is a simple test, followed by exams in English, Mathematics (e.g. calculating decrease in water volume) and other general knowledge questions as well as health and psychological tests. After twenty-three weeks of basic training, a mentor firefighter is assigned to the new-joiner for a period of one year and after its successful completion, it is his turn to fulfil mentor duties to new-joiners. In Liverpool, a driving licence for large vehicles (category C) is among the requirements and as soon as during the first year of service they have to drive fire engines more and more frequently.

Firefighters undertake further trainings on a monthly basis (training packs), focusing on a different area each month in view of recent incidents. When compiling the annual plan, fire commanders and staff are welcome to submit their own recommendations about their preferred development areas. Trainings which cannot be held at the fire station are carried out in regional training centres. In the case of the Merseyside Fire Department, the training centre is located in the Croxteth suburb of Liverpool.

In order to achieve a higher level of fire protection, it is important to mention a British campaign in which the fire service can give away and install smoke detectors free of charge on request to the public. This campaign significantly increases the number and quality of smoke detectors in homes.

Germany and its Fire Protection Activities

Germany has a total area of 357,340 square kilometres, with a population of 81,292,400 (based on 2015 data) and it has the world's 4th largest economy (2015 GDP figures). [10] The total number of deployments of firefighters between 2011 and 2015. (Table 3.)

Table 3. *The total number of deployments of professional firefighters.* [7]

Period (year)	Number of deployments (pcs)
2011	205,386
2012	N/A
2013	N/A
2014	N/A
2015	N/A

As we can see, unfortunately the CTIF[6] world statistics does not have data about some part, for example about last year's in Germany.

Similarly to Hungary, within the fire service (in German: *Feuerwehr*) we can differentiate between professional (also referred to as *paid* firefighters), volunteer and industrial

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6   *Comité Technique International de prévention et d'extinction de Feu* (Fr). Founded in 1900 in Paris, develops
     comprehensive world fire statistics.

organisation forms. Volunteer fire service is rather popular and widespread, well-equipped and continuously trained. Under the German law, cities with a population of more than 80–100,000 people (depending on the province) are required to maintain a professional fire service.

Volunteer fire brigades provide in a large number strong support to professional firefighters in their duties. In Germany, approximately 1.3 million trained firefighters work at different levels and in different ways. Out of the 1.3 million firefighters, 1 million serve as volunteers.

Emergency medical services are often carried out by firefighters, and in Hamburg there are only a small number of ambulance vehicles not belonging to the fire service.

Picture 14. (left) and 15. (right) *Ambulance and Fire cars and trucks, combined fire training ground at the Fire Academy of Hamburg, Germany, 2017.* [Author's own photos.]

Still about Hamburg, taken as an example, let us have a look at its fire protection operations together with the emergency medical service. In addition to the seventeen professional firefighter units, there are also 187 volunteer units. As regards the figures on interventions and emergency calls, besides the approximately 230,000 medical emergency interventions annually, the fire service is deployed to fires or technical rescues about 120,000 times a year.

Professional firefighters in Hamburg have two mobile command posts, which are typically set up in large buses designed for this purpose. The drivers and the commander of the vehicles are professionals, while the operators (of various communication systems, the vehicle, recording and forwarding reports) are provided by volunteer firefighters. A fire engine is located at the Hamburg Fire Academy (in German: *Feuerwehrakademie Hamburg*), while the newest purchase is on standby at one of the professional fire brigades.

In the course of further training, every firefighter is obliged to carry out fire container trainings every year (actual fire suppression in a controlled environment), including the staff of the 86 volunteer fire stations in the close vicinity of the city.

Professional firefighters work 24-hour shifts, during which each of them is a paramedic at the same time. Emergency service on the ambulance is performed in turns on a daily basis by members of the entire staff. They perform all general types of emergency medical service (administering injections, using a defibrillator, intubation etc.).

In Germany, those completing basic firefighting training (voluntary) are in fact only eligible to be present at the site as well as to perform minor auxiliary tasks. Further trainings,

courses are necessary to participate in more complex intervention activities. Such courses and trainings cover the use of breathing apparatus, driving an engine, operating a pump, interventions in the presence of dangerous materials as well as different managing and leadership skills. In the following part some of the incident commander positions are described. The squad leader is typically in charge in direct pair interventions, while the team leader is prepared to manage a bigger unit, generally a unit of eight in addition to the team leader. The battalion chief is entitled to lead at least three fire engines and their crews, up to 21 + 1 persons (including the chief himself). Priority interventions may require a leader or commander of a higher level than the battalion chief (in German: *Verbandsführer*), who can be in charge of up to three battalions during the actual intervention.

Unlike in Hungary where the alert time is regulated, in Germany the regulation specifies the arrival time. Following the alert, the ambulance has to arrive within five minutes, the fire service within twelve minutes. The recommended arrival time for ambulances of general purpose is seven minutes, while in cases requiring medical attendance, it is twelve minutes.

The training of professional firefighters (the terms paid or career firefighters are also used) starts with an eighteen-month basic training. The training of volunteer firefighters lasts twelve weeks, which is divided into segments, given the fact that volunteers typically have a full-time job. Volunteering is so deeply rooted in the fire service that certain special engines were meant for volunteer fire stations. For instance, the volunteer fire station in the centre of Lübeck (in German: *Freiwillige Feuerwehr Innenstadt*) houses a dangerous material detection apparatus (similar to the disaster management mobile laboratories in Hungary), purchased from the central government budget and manned by volunteer firefighters specialising in this field. An all-terrain truck for disaster management purposes purchased from similar resources can also be found at this station. It is also worth noting the adequate supplies and periodic replacement of personal protective equipment the fire station has. The entire staff is provided with protective clothing made of polybenzimidazoles (Polybenzimidazole—PBI) material ensuring the highest level of safety.

The training centre (in German: *Feuerwehrakademie Hamburg*) operated by the professional fire department in Hamburg organises basic and further trainings for firefighters of every status in the city. All conditions are favourable in the rather extensive facility for the simulation of various incidents and for practice-oriented trainings. Such incidents can be gas leakage, liquid fires, incidents in agricultural and industrial high-rise buildings, rail interventions, water and underwater interventions, accidents occurring during the transport of dangerous materials. Alpine technique training of several levels can even be continued indoor in case of bad weather. Besides the permanently installed container, a mobile fire simulation container is also available, which can be installed at various fire stations, thus avoiding transporting the entire staff to the Academy instead. Another good practice is the use of smaller practice tracks, such as for the training for movement on roofs, where it is also possible to remove tiles.

Picture 16. (left) and 17. (right) *Prepared fast fire hose and new PBI turnout gears in a volunteer fire station, Lübeck, Germany, 2017.* [Author's own photos.]

Not only the traditional firefighting, but also the emergency service training takes place here in various situations, for example, rescuing a person suffering exhaust fume poisoning in a family house garage. [11]

Italy and its Fire Protection Activities

Italy has a total area of 301,318 square kilometres, with a population of 60,599,936 (based on 2016 data) and it has the world's 8th largest economy (2015 GDP figures). [12] The total number of deployments of firefighters between 2011 and 2015. (Table 4.)

Table 4. *The total number of deployments of professional firefighters.* [7]

Period (year)	Number of deployments (pcs)
2011	230,244
2012	241,232
2013	196,196
2014	189,375
2015	234,675

The Italian fire service (in Italian: *Vigili del Fuoco*) has been a unified national fire and rescue organisation since 1941. It boasts having the oldest firefighting traditions of the world originating in as early as the Roman times. Although scientifically not an important data, it is important to note that outlets of Roman wells famous for their fresh water can be found at certain fire stations. 24–72 as well as 12–24, 12–48 shift schedules are also in use.

The building of a professional fire brigade in Rome inaugurated in 1929 also functions as a museum, built in the style of the Roman Empire. This brigade can rather be characterised

as a special station without a commander of its own, its crew only performs standby duties. As regards its apparatus, an auto pump, a tanker, an aerial and an apparatus equipped with a jump cushion are all on continuous standby among the antique walls. A dangerous material apparatus and a special apparatus for both roads and water are also available without a permanent crew, thus with possible delays in alert. For interventions in the presence of dangerous materials, engines of various sizes and designs are on standby at the Italian fire service. There are examples of larger engines with swap bodies and containers, ones of middle-category with fix bodies, but also lighter engines with swap bodies, as well.

Picture 18. (left) and 19. (right) *One of the oldest fire stations in Rome and a very special fire truck staying there, Italy, 2017.* [Author's own photos.]

The fire protection in Rome, Capital City is ensured by thirty-two professional fire brigades. The population to be protected—including the unregistered inhabitants—is around 3.5 million people. The lack of Italian language skills is noticeable among certain parts of the immigrant population (similarly to the situation of the London Fire Brigade). In stations where the social conditions are met women can also join the crew and work as intervening firefighters, although their number is around six in the capital.

In the Mediterranean country, the daily work is complicated by the fact that—except in a few special places—there is only one kind of uniform footwear, that is the protective boots. However, further personal protective equipment such as the protective helmet and coat are generally placed on fire engines and put on at the site. [13]

Fire engine crews typically consist of the driver, the leader and three operators. At the site, the colours of the helmets signal the position of the wearer. Operators wear black helmets, the leader of the engine red, while senior officers wear grey ones. Only one white helmet is standardised in Italy and it belongs to the national commander. Rank insignias and badges showing time of service are not common on uniforms. Typically, only jackets display such signals, former arm insignias have been replaced with uniforms and embroidered firefighter patches over the last few years. Members of the urban search and rescue team (USAR; similarly to the Hungarian professional rescue organisation HUNOR) wear a separate patch. As regards the ranks, in short, it can be said that time-in-grade requirement is basically five years and positions have maximum rank ceilings. For instance, the category of a subordinate firefighter is signalled by a red mark at the time of the appointment, changing it every five years by adding a new V-shaped mark up to three times. In principle, it is similar to the sergeant ranks

in Hungary. Shift commanders (in Italian: *capo turno*) has a gold line on a red background at the time of the appointment and by receiving the second line, they reach the rank ceiling.

Taking a flagship fire station in the city centre as an example, it is remarkable that the high-pressure wound hose (Storz system) attached to the water cannon of the aerial ladder platform is also fitted with a spring fastener. However, threaded fasteners are not uncommon on fire engines either. Fire engines are also marked by type as well (for example, AS1 ladder, 1A auto pump). An urban search and rescue vehicle is also available in the capital if equipment and tools are needed to stabilise and shore ruined buildings.

As regards emergency numbers, there are several solutions in use across the country, generally it is 115 for the fire service. In Rome, uniquely, it is 112, where emergency calls are handled in a call centre by civilian employees in accordance with the subject of the call.

There are altogether three alarm levels to rank the severity of the fire and damage. Operations control uses a colour code system to indicate the status of the vehicles. Engines marked red are out at the scene, green ones are on standby at the fire station, whereas yellow ones are travelling back or being refilled with water etc.

Picture 20. (left) and 21. (right) *A light mobile hazardous material unit with changeable container and the city communication centre of fire service, Rome, Italy, 2017.*
[Author's own photos.]

The country's central training centre is also located in Rome. The institute boasts a rather long history, dating back to the 1940s and it can be considered well-equipped. Basic training lasts six months, which is continuous, and courses on firefighting are also held for other uniformed organisations, as well. Commanders and incident commanders take part in a one-year course (which might be shorter temporarily in the future for organisational reasons), while officer retraining lasts two and a half years (also when it specialises in fire prevention). One can only become an officer if there is a vacancy, if he holds a civilian degree and is supported by the commander. In light of the above, waiting time is rather long and there is no specific university course in this field in Italy. Instructors coming from all over the country take part in the training and share their professional expertise.

In the firefighting training centre, a lot of emphasis is placed on providing sports facilities, which is supported by various governmental organisations, for example the Ministry of Sport. Since swimming classes are also included in the basic training, an indoor swimming pool is also available, which has a separate deeper section for practicing underwater exercises and

diving techniques. Water rescue skills must be mastered by urban search and rescue team members.

Each of the intervention areas and venues has been equipped with separate practice fields, such as a ruined city area, a place where dangerous substances are present, various roof structures, unstable window openings in different designs which need shoring. It is important to mention in the alpine techniques training that instead of the climbing belts used in Hungary, harnesses are standardised at the fire brigades offering a higher level of safety. [14]

Italian manufacturers of fire fighting vehicles (for example, Brescia Antincendi International Srl—BAI) ensure that domestic expectations are met. An interesting solution is the safety barrier on a Volvo fire truck, which automatically opens on the top of the vehicle, operated by a pneumatic system, when the back-ladder to the top is opened. The *start* system, which helps to keep the vehicles on standby, can also be found, in some cases on the rear side of the vehicles. There is also an example of a mobile lighting trailer that can be towed by a fire engine and several boats are also on standby. The winter period typically brings heavy rainfalls resulting in flood risks for the Italian fire service.

Picture 22. (l) and 23. (r) *Building stabilizing trainings in the Italian fire education centre and a mobile sleeping car for long term interventions, Rome, Italy, 2017.*
[Author's own photos.]

Based on the experience gained in a suburban fire brigade (in the city district EUR), it can be seen that the fire brigade building can become completely empty—outside office hours—when an alarm comes in and the fire engines are dispatched. At various fire brigades, as it could be previously seen, special fire engines are kept dislocated, depending on free garage places, such as a mobile sleeping car, in which up to eight people can take a rest during prolonged interventions, and it is also suitable for technical rescue to a basic extent due to some technical equipment it possesses (for example, a floating pump, a pneumatic lifting pad etc.).

Unlike in the United Kingdom, there are no mobile terminals and on-board computers on fire engines in Italy. Maps are prepared specifically for the conditions of the intervention sites (reinforced and waterproof).

As regards breathing apparatuses and masks, after the interventions, the masks are sent to a central workshop for maintenance and cleaning, replaced by already inspected masks from the local stocks for the firefighters concerned. For this solution we can see examples from several countries.

Conclusions

When examining international fire protection operations, and at the same time a bit of traditional ambulance services, the used technical equipment and procedures, slight differences and variations can be observed. [15] In this paper fire protection operations in five countries were examined, Hungary, Poland, the United Kingdom, Germany and Italy. Good practices and solutions can be found in each country, whose adaptation seems reasonable to other countries, as they are likely to have a favourable impact.

I make recommendations on considering the following elements, listed by countries.

From *Poland:* there are a lot of good practices in the area of training fire officers, decision makers by the Main School of Fire Service in Warsaw. It is also interesting to mention the freely modifiable training scenes with real fires and smokes near Zamczysko and the absolutely freely buildable and usable computer simulation room in the centre of the university.

From the *United Kingdom:* Fire engines performing firefighting and primary intervention activities are equipped with mobile terminals and simple, easy-to-use printers, thus facilitating flexibility, orientation on the site and management of the response. Developments have already begun in Hungary in this field (developments of the National Directorate General for Disaster Management for on-board PCs). Instant access to data that can be easily updated, with firm background support and the possibility for quick, simple and cheap printing on the spot can all be of significant help for the firefighters and the commanders in certain cases. It may be worth considering the achievements of British firefighters with outstanding international experience. At the same time, auxiliary hand tools, equipment mentioned in the paper also increase safety and effectiveness of the intervention. These are for example the so-called hooligan tools, self-adhesive protection films and battery-powered equipment allowing greater mobility and flexibility. Telemetry commonly used in respiratory protection in the UK is also a good example, although expenses are much higher than those of simple designs.

From *Germany:* A very strong voluntary presence in the fire service is clearly one of the major strengths of the German fire protection system. Their deep involvement in fire protection operations and disaster management result in an increased effectiveness and at the same time, lower costs. Their training and further training system is very varied and thorough, there are good opportunities for trainings in individual areas, close-to-reality situations, and sometimes even in mobilised versions.

From *Italy:* Hybrid fire trucks that can be used in a complex way, both on water and on land can be of good help in firefighting, technical rescue and disaster responses. Preliminary assessment prior to the procurement may be justified, it is worth paying attention to issues of purchasing, maintenance and applicability. The general use of alpine technology equipment and training and the use of straps for self-rescue (similarly to the United Kingdom) increases effectiveness and safety of the firefighters. Integrating swimming training into the basic training and further practice to maintain these skills can also be a good example for fire stations where water interventions are likely and can be expected.

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The OSCE and the Crisis in Ukraine.[1]
Focusing on the Theoretical Characteristics of the European Crisis Management.
Concepts, Players, Tools, Vision

Éva REMEK[2]

> "No doctor will be able to help anyone who has neither visions nor a compass for the future at a time of fundamental upheavals and challenges."[3] [1: 5]

European security and defence policy is one of today's main topics. One of the reasons for this, is the high number of operations conducted by the European players in regards to its crisis management. The second reason we can find in the actual substance. Testament to this is Europe's fight for global peace and stability. To achieve this, the robust international presence is imperative. Especially in places, where following an armed conflict the state's structure is destroyed and aiding the creation of the new political structure, as well as levelling the democratic playing field is needed.

Operations conducted in crisis management are not limited to European ground only. In the creation of global and regional stability, which is paramount from Europe's point of view due to its nature, a shift occurred: from military power to civilian power.[4] This justifies the need to deal with European security, with particular regard to crisis management and international actors, including the OSCE and its role in Ukraine. I prefer this analysis to be a theoretical approach (thought provoking) than to fully present the Ukrainian crisis. And I look at it from the point of view of the OSCE.

Introduction

Security and its absence, which due to its complexity is an ever recurring problematic topic, is heavily connected to managing various conflicts and local and global crises. Looking at our topic we cannot ignore the fact that during the changes of the nineties, which was the time of the fall of the possibility of global confrontation, the number of local and

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3   German Chairperson-in-Office, Frank-Walter Steinmeier said in December 2016 in Hamburg at the 23rd Ministerial Council.

4   For the importance of civic attitudes see another similar example: [35].

regional conflicts have risen. The variety of these conflicts meant a great deal of challenges to the international players, namely various governments, states and national organizations, e.g. the European Union (EU) and especially the Organization for Security and Co-operation in Europe (OSCE), (hereinafter Organization).

Even at the end of 2016, the German Foreign Minister, Frank-Walter Steinmeier said—he was officially the OSCE's Chairperson-in-Office in that year—the OSCE arrived at crossroads. Furthermore it faced a number of serious security challenges e.g. mass migration, terrorism, conflict in and around Ukraine, crises close and far from Europe (Moldova, Syrian crisis). And the *vision* of a cooperative and comprehensive security is also in danger. What can be done at this point? He believed that "the OSCE must become more effective and more capable of taking action as regards preventing and resolving conflicts." [1: 3] This analysis aims to examine this endeavour. How does the OSCE achieve a goal? What methods will be effective in crisis management in the Ukrainian crisis?

The paper shows e.g. that the chairmanships (it is called Troika, which consists of the previous, current and succeeding OSCE Chairmanships) of the Organization were ready to lead an important dialogue and co-operation in various fields of common interest and principle using every tool of the OSCE (old and new tools, such as the confidence building measures [CBMs] and cyberspace, cyber security—according to experts that is just what it needs, namely CBMs can improve cybersecurity). [2]

Concepts

First of all it is worth analysing the concept of the security-conflict-crisis-security sector reform, although these terms are all well known, still their meaning can change from time to time. This is particularly true from what we have experienced in the past twenty five years as the subject's experts or enthusiasts. The reason is the diversity in concepts of security was created by the different theoretical school [3: 37–46]

Secondly, here are a few words about the extended meaning of security, which comes under a five dimensional model, developed by Barry Buzan and his colleagues. In this we can observe the problem through different perspectives. These elements are economy, military, politics, societal and environmental security. [4: 439] Concerning the five sectors, we can talk about lack of security, when there is an existential threat.

Thirdly, we can describe conflicts in many ways. "The origin of conflict is within the human mind"—wrote János Matus in one of his publications, then continues: "All violent acts are preceded by a chain of thought, within the acts similarities or differences, the harmony or disparity of the values." [5: 83]

Last but not least, a few words about crisis. We are talking about crisis when accumulated stress comes to the surface in such a way, that it cannot be determined a war situation. It is true, the likelihood of the use of violence is rather high. This term is used mainly to describe an uncooperative period among states.

What are the reasons for a prolonged crisis situation:
- there is an unreasonable disagreement among participants;
- this (crisis situation) touches on existential interests;
- the efforts to resolve the crisis situation fail;

- and there is a chance of war developing among the participants (a good example of this is the Cyprus debate today).

It is crucial to define conflict and crisis, and it is even so nowadays, when it is essential for the effective response from the European international actors for European security order such as the European Union or the OSCE, as the representatives of the soft security, rather than NATO.

According to some expert opinion, e.g. the *Trends in Armed Conflict 1946–2014* report [6: 2] or to Janusz Bugajski's opinion, [8: 1–2] we can see, (despite a wide range of approaches, there is a common element in these analyses), that the number of civil crises and the number of civilian casualties have increased since the nineties.

So it can be said that conflict has three types: intra-state, inter-state (in the traditional sense of the territorial disputes or even escalating of the intra-ethnic conflicts, etc.) and trans-state (today's global security challenges e.g. cyber-attacks, international terrorism, trade, energy security, etc.).

Accordingly, in a little more detail, the intra-state conflicts include civil conflicts, which can cause ethnic conflicts, economic hardships, separatist activity, refugee problems, serious military intervention etc. All this can be strengthened by the weakness of the state, or precisely because of the state's economic and foreign policy uncertainty.

I think this was well exemplified by the Ukrainian case. Firstly, let us see some key statistics on Ukraine. Ukraine is located in Eastern Europe. Its neighbours are Poland, Belarus, Russia, Romania, Moldova, Hungary, Slovakia, the Black Sea and the Sea of Azov. Its population is 44,209,733. [9: 227] Many ethnic groups live there: Ukrainian 77.8%, Russian 17.3%, Belarusian 0.6%, Moldovan 0.5%, Crimean Tatar 0.5%, Bulgarian 0.4%, Hungarian, Polish and Romanian 0.3%, Jewish 0.2%, other 1.8% (2001 est.). [10] In 2015 the inflation was 48.7% and in 2016 only 15.06%. [9: 227] These are *telling* numbers.

The Ukrainian economy was weak with a high degree of financial uncertainty; it can be seen in the data of the World Bank, namely that the Ukrainian GDP growth was in 2012 0.2%, in 2013 0.0%, in 2014 –6.6%, in 2015 –9.8% and in 2016 2.3%.[5] The European countries have tried to help her on the path of reform. This growth was achieved by financial support and expertise, especially e.g. regulatory issues, agricultural and rural development, energy-sector reform[6] and Security Sector Reform (SSR).[7]

This latter reform is slowly moving,[8] so in particular the work of the EU here is very important (the EU Advisory Mission in Kyiv). Key partners of the EU on the Security Sector Reform are the US, Canada and OSCE. It can be said that the Security Sector Reform has become one of the major crisis management tools of international crisis management methods. (See Figure 1.)

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[5] See details and comments in [36].
[6] See details in [37: 11–12] [37: 23–38].
[7] Key definitions can be found in [39: 4].
[8] For reasons and details of this, see [40].

Figure 1. *The elements of the Security Sector.* [41]

What is the security sector reform from the point of view of the OSCE? As the OSCE Secretary Genaral, Lamberto Zannier said in June 2017: "A security sector that lacks […] can contribute to deteriorating security conditions and escalation of violence and conflict. […] well-functioning, accountable and resilient security sector can play an important role in managing emerging conflict situations and preventing escalation and recurrence." [7]

It is worth highlighting the OSCE's Project Co-ordinator (OSCE–PCU) in Ukraine [27] field operations, because it participates in 34 *projects,* such as Parliamentary and Public Oversight, Disarmament, Demobilisation and Reintegration (DDR), small arms control and transitional justice (Justice Reform), or the gender dimensions of security, etc.[9] [43]

Therefore, in the OSCE context, the Security Sector Reform, as an old and new tool, played/plays an important role in conflict prevention. In total, while we were clarifying the concepts, we have also gained a slight insight into the OSCE's crisis management toolkit.

To sum up, the crises and the challenges in the period after the cold war sparked the need for new solutions. The international players have been looking for correct answers ever since the beginning of the nineties, but it became apparent rather quickly that, in crisis management the running of military operations are not enough. As I mentioned, in the year 1990 the crisis that took place previously among states, migrated to within the states themselves. Due to the nature of these problems, this forced new tasks onto the ones trying to solve them. The document created by Boutros-Ghali stated that the use of new tools are needed in the resolution of new conflicts, and due to the complexity of the situation, it demands a deep co-operation from the international actors and the international organizations. "Although

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[9]   See details in [43].

the subject of my report is on the skills used by the Global organization to improve on the peace making and pace keeping skills […] the member states cannot forget that the research invested into discovering better mechanisms are only significant if, this new communal spirit is moved by will, which is mandatory in the current need for difficult decisions." [44: 6] The United Nations Security Council have accepted the report and marked four areas where the UN's activity is needed in the future: preventive diplomacy, peacemaking, peacekeeping missions, peace development. [44: 14–34] Military operations are not enough in the new style of crisis management, other activities, such as peace keeping and peace building also became a part of the picture. The OSCE contributes to this work…

The OSCE and the Ukrainian Crisis

After the cold war the OSCE, like other security organizations (such as the UN, NATO, the EU), is being adapted to this new security paradigm and until the beginning of the first years of 2000 the OSCE was really modernized. Since 1995 (CSCE—the Conference on Security and Co-operation in Europe has a new name, namely it has become OSCE) it has played a constructive role in cooperation from Vancouver to Vladivostok.

Unfortunately, the dynamism of modernization was lost by 2013. What is the reason for this? The Ukrainian crisis, which "plunged the OSCE also into an existential crisis, threatening its role as legitimate guardian of European security." [11] The Ukrainian crisis led the OSCE into crisis management, because its role as a classic defender of European security was shaken. The idea (that was born yet under the Swiss Presidency in 2014) was to prepare the basis for "an inclusive and constructive security dialogue across the Euro–Atlantic and Eurasian regions, taking into consideration the Ukraine crisis in its broader perspective as well as other developments in the OSCE area where participating states consider their security to be threatened." [11] That is why it is important to review some events between 2014 and 2017, firstly the beginning and then the causes of the crisis.

The Ukrainian crisis began with protests against Ukrainian President Viktor Yanukovych's decision. It was in November 2013. The reason for that was that the President refused an agreement for the economic integration with the European Union (see later).

The next element of the crisis occurred when Russia annexed the Crimea so fast that the West (the US and Europe) could only be surprised. The next step was the war in the Donbas (it is well known that it has two parts Donetsk and Luhansk), the West was still a passive viewer.

Finally, since the beginning of 2015, Ukraine, Russia, France, and Germany have tried to solve this difficult problem, which resulted in an agreement, namely the Minsk Accord II.[10] This Accord has three main parts. These are: a cease-fire, withdrawal of heavy weaponry, and full Ukrainian government control of the whole conflict zone. The question arises whether the Minsk Accord can be a new hope?[11]

According to the topic's expert, the conflict in Ukraine caused huge damages "of territory (7%) and population (15%), loss of lives (ca. 10,000), and also forced 2.5 million people

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[10] In order to avoid any misunderstanding, there were two agreements. The first agreement was signed in September 2014, the second one was signed in February 2015.
[11] See possible answers in [45].

to leave their homes." [12: 3] However, in this context again a question arises whether the Minsk Agreement[12] is a success or a failure agreement. It is worth checking out some reviews of experts. [13]

The opinions are very different, but one thing is common. Namely that the agreement has reduced the violence and the number of casualties in eastern Ukraine. But quoting Pierre Vimont words this Agreement "has not delivered an end to the current conflict or a political solution to this confrontation. It is far from certain that the Minsk process was ever intended to do so, and the reality on the ground makes success even more unlikely." [14]

The Ukrainian crisis is in the first instance a domestic problem and its resolution will depend on the Ukrainians themselves. But it is well known that Russia also has a key role in resolving the crisis. But why is Ukraine so important for Russia? Zbigniew Brzezinski compared this region (Eurasia) to a chessboard in his book with a similar title. [15: 9] According to him the main players are the US, Russia, the EU and NATO. In his book, Brzezinski writes that without Ukraine, Russia "ceases to be a Eurasian empire and would become predominantly an Asian imperial state at risk of being drawn into conflicts in Central Asia." [46] But if Moscow were able to gain control over Ukraine and its resources, in his view, the Russian Federation would be a *powerful imperial state.* [46] It is clear, therefore, that geopolitically, Ukraine is a key area for everyone.

It is a well-known fact that after the collapse of the Soviet Union, Russia had difficulties accepting the independent Ukraine. In addition, the planned EU–Ukraine Association Agreement (Deep and Comprehensive Free Trade Area at the Eastern Partnership) which was to happen in November 2013, quite clearly projected that Russia was losing Ukraine. [16] So, we go back to the starting point, i.e. when the Kremlin put pressure on Ukraine in 2013, imposing *limiting measures*[13] on Ukrainian exports to Russia. However, Russia "crossed the Rubicon" [26] when she annexed Crimea and started a military attack in Donbas.

Hereupon the Ukrainian leadership had two options at that time of the crisis: the signature of the Free Trade Agreement with the EU or the acceptance of Russia's economic assistance. [17: 5] Finally the last option was chosen. It can be interesting for my research topic to explain details of the Ukraine–Russia relations by focusing on why and how Ukraine reacted to, and engaged with Russia-led projects for regional integration, but its detailed explanation will be the subject of an another analysis.[14]

It is noteworthy to examine yet another feature of the crisis, which also greatly influences the work of the OSCE. This, in turn, is the problem of national identity. I think this will be a more and more significant research field among security challenges in the future. Namely this security aspect is related directly to the issue of human security, human rights and indirectly to Security Sector Reform (see above) especially in this region.

Furthermore, here are two more reasons which are important to mention: the issue of identity and human security. On the one hand, it is important because it

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[12] Firstly Minsk I was born, this Protocol on the results of consultations of the Trilateral Contact Group, signed in Minsk, on 5th September 2014. http://osce.org/home/123257 (Downloaded: 22.08.2017) This was complemented by a memorandum. (Memorandum of 19th September 2014.) The failure of the implementation led to the signing of an additional ceasefire agreement, Minsk II, on 12th February 2015. http://osce.org/ru/cio/140221?download=true (Downloaded: 22.08.2017)

[13] Helpful data are available in CEPS Working Document. [47: 1–4]

[14] I recommend Albert O. Hirschman's seminal work (1980). Referred in [19].

constitutes the cornerstone of all democracy. On the other hand, traditionally the OSCE (from the seventies e.g. The Helsinki Final Act 1975)[15] pays much attention to the issues of human rights and human security. This is also practiced in Ukraine. A good example of this is the field operations, already mentioned above, the Project Co-ordinator in Ukraine (PCU). It implements projects focusing on "spreading human security norms within the civilian security sector reform in Ukraine, namely: training new police patrol officers in combating human trafficking and domestic violence; improving community police approach; training the reformed neighbourhood police units; supporting human-rights-based education." [18: 2] As the OSCE in general became the "eyes and ears" [49] of the international community, thus PCU published many documents with recommendations on e.g. the human security situation.

Without aiming to give an exhaustive summary of all reasons, but in the light of the above, the complex nature of the Ukrainian situation (between East and West) can be clearly seen. As Keohane and Nye said "employing force on one issue against an independent state with which one has a variety of relationships is likely to rupture mutually profitable relations on other issues." [19: 693] Ergo Russia wanted reintegration of her neighbour, but Ukraine wanted to be part of the West, still the government's action suggests that nevertheless it aims to be part of the East.

Next year (2015) the Normandy Format (Germany, France, Russia and Ukraine)[16] was formed. Their discussion is an important step for any political attempt to resolve the situation in Donbas. All players have underlined that this is essential and have publicly stated their strong support for it. The role of Ukraine in the Agreement (Minsk II) is very important. But the stronger party—"Russia and its proxies"[17]—has been uninterested in the fulfilment of its (Ukraine's) commitments, and this attitude will weaken its chances. Therefore, Ukraine's situation in these days is not easy. "Russia,[18] the aggressor, which claims that the situation in Donbas is a "civil war,"[19] sits at the negotiating table and appears to be trying to look for a diplomatic solution." [21: 72]

It is a known fact that, what Ukraine needs is a responsible and stable state. But it has an over-bureaucratized system that accepts real power to be exercised in the shadows. In turn,

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[15]　More details in [48].

[16]　Created on 6th June 2014, when the leaders of France, Germany, Russia and Ukraine met on the margins of the 70th anniversary of the D-Day allied landing in Normandy. This was the first meeting between Presidents Vladimir Putin of Russia and Petro Poroshenko of Ukraine since the crisis had erupted in Ukraine. The Normandy Format does not include the United States or the European Union, nor any other European countries beyond France and Germany.

[17]　As described Besemeres (whole paragraph from him) the Minsk II Agreement uses the lots of shooting words like Ukrainian sovereignty and "in accordance Ukrainian law". But in the text are some significant concessions to both the proxies and Russian sponsors. To mention for example: "Ukraine is required to reach with the "representatives" of Russia's proxies in eastern Ukraine (legitimating them as negotiating partners for Kyiv's elected government) on constitutional changes that would decentralise government. This is the condition of Kyiv's recovering access to that part of its eastern border that is now controlled in tandem, by the proxy forces and the Russian army. The proxies are given the freedom to form cross-border cooperative arrangements with Russian authorities." More details in [51: 422–423].

[18]　"Russia is like a wolf in sheep's clothing." [16]

[19]　Is Ukraine really headed for "civil war"? The name of the "civil war" is controversial, so there are several explanations. Some opinions are for (inter alia Oliver Boyd-Barrett: *Civil war*) and some against (inter alia Fisher [52] or László Póti stressed that what happened in Ukraine was not a revolution, a civil war, a coup d'etat, an ethnic confrontation, or an outside manipulated series of events but a clear rebellion, antitrust action, and an attempt to break with the Soviet past. [53]

President Poroshenko has supported political democracy in Ukraine, but he has not supported a deep reform of the system of power. However, it is a fact that he does not do anything against oligarchic interests. In this free but not transparent environment, Russia continues to work to destabilize the country via "hybrid ways."[20] Some experts said two perceptions of Ukraine: "one is, that Russia will widen the war (Russia continues to maintain a large concentration of forces in close proximity to the Ukrainian border); the other is, that the West will grow tired and walk away." [17]

Many and many different analyses were written in connection with the Ukrainian crisis. During my research work I found remarkable comments by James Sherr about two misperceptions. He said these have determined the Russia-Ukraine conflict from the beginning. The first misperception is that Russia holds all the cards. Sherr's opinion is that by now, Ukraine has already refuted this. The Russian military power is really deterrent, but with the right diplomatic cooperation of Ukraine and the West it could be counterbalanced.

The second misperception is that time helps Russia. In his opinion, this has not happened, yet. In November 2014, a prominent regime ideologist told Mr Sherr, that "by next winter, there will be no Ukraine […] but […] Ukraine was stronger two years later than it was at the beginning. Yet time is not a strategic actor. It must be used." [17] Russia thinks that she has enough military and political power for the Ukrainian governance structure to collapse. Until the time comes that Ukraine and the West change their current perception of their own security and interest, unfortunately, the conflict will not be settled. I think there was enough evidence to prove Ukraine's strategic importance for Russia.

The OSCE and its Role in the European Security System

Today this organization has 57 Participating States in North America, Europe and Asia. The OSCE is the world's largest regional security and pan-European organization. The OSCE works "for stability, peace and democracy for more than a billion people, through political dialogue about shared values and through practical work that makes a lasting difference." [23] Moreover, the OSCE is being consensus-based. This is an important advantage, but at times this causes difficulties in making decisions and progress, nevertheless it balances the conflicts of interest among partners.

The OSCE is chaired on a rotational basis by the Participating States. Each state holds the chairmanship for one year and this capacity plays a major role in governing the work of the organization and in representing the OSCE in the world. "The Foreign Minister of the chairing state holds the function of the Chairperson-in-Office." [55] The rule is that the task of the Chairperson-in-Office is exercised by the Minister of Foreign Affairs of the concerned state (e.g. in 2017 Austria).

And now let us look at our topic: what were Austria's priorities for her 2017 Chairmanship? Austria defined the priorities for its Chairmanship of the OSCE 2017 in response to the current

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[20]   The analysis does not want to go into the explanation of the concept because the recent Russian intervention in Ukraine has generated much debate about the use and effectiveness of hybrid warfare, a type of warfare widely understood to blend conventional/unconventional, regular/irregular, and information and cyber warfare. More details of this expression see in [54].

threats and challenges in the OSCE area.[21] In the context of her Chairmanship, Austria focused on [56] contributing towards solving existing conflicts, especially concerning the Ukrainian crisis.

As I mentioned at the beginning of my work, the last few months have seen a further worsening of conflicts, which have already resulted in numerous victims, displacements and destruction (data see above). The Austrian Chairmanship therefore placed a major focus on addressing and countering these developments. "There can be no military solution for the existing conflicts in the OSCE area" said Sebastian Kurz, who travelled to Ukraine in January 2017. The crisis in and around Ukraine necessitated the presence of the OSCE for the security of people's lives and to help operating normal life. He underlined the need to continue supporting and further strengthening the work of the Special Monitoring Mission to Ukraine, which was deployed in 2014. Furthermore Sebastian Kurz pointed out the importance of co-operation with the Trilateral Contact Group[22] and the OSCE Chairperson's Special Representative Ambassador Martin Sajdik, as well as the Normandy Format, because a solution needs to be found to the crisis. [25]

Here a little detour is worth making for explaining the relationship between the EU and OSCE. From the beginning the EU was a strong and basic actor within the OSCE.[23] It was essential, because the EU member states had well thought out plans that they would have liked to achieve through the OSCE. It was also important that they clearly articulated the OSCE's role, with the EU's interests in mind. Despite a very good practical co-operation between these organizations, the OSCE–EU partnership should be strengthened to become more strategic. According to experts, there is a solution to this. The EU–OSCE relationship should be based on a more pragmatic cooperation of some common interests (e.g. the energy field, global and regional security challenges such as terrorism or climate problems, etc.). [26: 3–4]

The OSCE has no military capacity (contrary to NATO) and this limits its risk management competence. The OSCE has a limited legal capacity (contrary to the EU) and this limits its relationship management competence. But the OSCE e.g. has confidence-building competence and it is a forum for interstate dialogue, where cooperation is built on trust and confidence and as a rule, debates can end in results. All this together gives the uniqueness of the OSCE crisis management forms.

The OSCE Crisis Management Forms in Ukraine

The OSCE's field operations[24] help host countries (where the OSCE performs its task) in putting their OSCE commitments into practice. (The information below has been taken from (partly as a whole) the German Federal Office's [25] and OSCE's website; [27] other sources are marked.)

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[21] Beyond that: "Contributing towards defusing existing conflicts, and re-establishing trust and confidence." [55]
[22] The Trilateral Contact Group on Ukraine is a group of representatives from Ukraine, the Russian Federation, and the OSCE.
[23] All 28 member states are members of the OSCE.
[24] Currently there are 16 missions to the OSCE. [50]

Currently, in Ukraine there are three field operations. Briefly about them:

1. The OSCE Project Co-ordinator in Ukraine (PCU) was mentioned earlier. To sum up, it can be said, that the work of this mission covers all aspects of the OSCE activities. Moreover the governmental and non-governmental bodies of Ukraine was joined in this job. [27]

2. Special Monitoring Mission (SMM): In March 2014, the OSCE Permanent Council deployed a civilian Special Monitoring Mission. This is the largest mission of three. Mission members are 1,172 monitors, from 44 countries. [30] The presence of the SMM is intended to try reduce tensions, but sometimes it seems without real success.[25] Furthermore, its daily reports are meant to contribute to transparency and consequently, stabilization. With the Minsk documents of 2014 and the Minsk package of 2015, the SMM took on essential tasks, namely controls the ceasefire agreement and the implementation of the revocation of heavy weapons. [28] The difficulty is caused by the fact that the civilian populated areas are not fully controlled by the OSCE mission. So the residents there often encounter a cumulative risk. E.g. they usually meet freedom of movement restrictions imposed (sometimes on both sides), thus they go through mined woods… or the situation is further complicated by lack of adequate health care in these areas, furthermore no electricity or drinking water is available… it is a real humanitarian crisis.

3. Observer Mission at the Russian Checkpoints Gukovo and Donetsk (OM): Nowadays the mission comprising 22 civilians has been observing traffic at the checkpoints on the Russian–Ukrainian border at Gukovo and Donetsk since July 2014. The OM operates on the territory of the Russian Federation. The observers regularly observe activities across the border at the Donetsk and Gukovo checkpoints. [29] The latest notable news is that the OSCE Permanent Council decided by consensus to extend the OM's mandate by three months to 31 January 2018. [33]

All in all in 2017, under Austrian chairmanship, the OSCE faced a difficult task, which has tested its crisis management practice. Meanwhile the events of the crisis in Ukraine helped to find the OSCE, namely the organization itself. In the meantime, apparently the West concentrated on building up deterrence within NATO (to avoid a new Crimean example in the Baltic).[26] The OSCE started work in Ukraine first and foremost, then cooperated with other organizations, firstly with the UN. All in all, neither the Austrian chairmanship nor the OSCE could settle the Ukrainian conflict in 2017, because "this would require the political will of all 57 OSCE Participating States and the decades-long alienation of Russia from the Euro–Atlantic security architecture cannot be reversed overnight." [31]

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[25] E.g. the SMM wrote down approximately 19,700 ceasefire violations between 27 November and 10 December – for the previous week this was 25% more. [30]

[26] At the Warsaw Summit, NATO decided the establishment of an enhanced forward presence in Estonia, Latvia, Lithuania and Poland based on four battalion-sized battlegroups. [42] [38]

Conclusions

The OSCE is based on two advantageous values. These are its inclusive nature and its consensus-based decision making. But it has a significant weakness in terms of leadership (e.g. annual change of the chairperson, consensus decision of the 57 Member States) and effectiveness (e.g. lack of competencies), which limits the potential of the organization. [20] We can say that its huge geographic size has little functionality.

Lilia Shevtsova said that "as long as the current authorities continue to run Russia, it is hard to see them letting Ukraine go." [32] Robert Golanski pointed to an interesting parallel when he was analysing Russian actions in Ukraine of Winston Churchill's words: "From what I have seen of our Russian friends and allies during the war, I am convinced that there is nothing they admire so much as strength, and there is nothing for which they have less respect than for weakness, especially military weakness." [22] Then Golanski finished: "Weakness is no longer an option for Ukraine." [16]

Experts agreed that after the full implementation of the Minsk Agreements, the next urgent task is to stop the hostility in Ukraine, because without this there will be no stabilization later. Furthermore it has been remarked that "the Special Monitoring Mission has to walk a fine line between the sides demands for verification and security of its own staff." [34: 24]

Now it seems that the OSCE's "compass and vision" (as a forum for inclusive and security dialogue which is both a tool and a method) does not allow the conflict to continue to icing. This way the global and European players such as the UN, the OSCE, the EU, NATO, the Council of Europe, and others can create stability in the OSCE area.

In order to create a real sustainable (common) European security order, it would be worth focusing on the (common) Eurasian security order, too. The OSCE has the opportunity to take this step, because the key characteristics of the OSCE is adapting to new challenges.

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Life Sentence Without the Possibility of Parole. "We Do not Allow Them to Live, We Do not Let Them Die"[1]

Péter RUZSONYI[2]

In the first part of our study (Serial Killers on the Other Side of the Bars: "Bestial Humans—Human Beasts") we focused on the crimes committed by serial murderers, identified alternatives of classification and analysed their behavior within the prison walls. In the upcoming part, we will investigate international and domestic experiences related to the use of life without parole; review the way of life of those who have been sentenced to "life until death"; examine the punishment's mechanics and impact and finally conduct an analysis of the present form of the notion "not allowing them to live, not letting them die". The basis for this inquiry is the fact that currently, 67% of the serial killers serve a sentence of life without parole. [In Hungary, the practice of sentencing convicts to life without parole is regulated by the Criminal Code. In its principle, this form of punishment means that those who receive this sentence will never be released on parole (42. §). Article 46/A–B of the Prison Code; however, it also introduces a mandatory clemency procedure for those who are serving a life sentence without parole. This procedure may be initiated after 40 years served.] Furthermore, we also endeavour to collect the characteristics of this sanction, evaluate related professional opinions and put forth a suggestion for an amendment, as well.

Keywords: *serial killers, life without parole, international practices, time as a dimension, criminal-pedagogy*

In Hungary out of the convicted 13 serial killers, 11 have received a life sentence without the possibility of parole since the introduction of the sentence of life without the possibility of. We consider that this figure in itself provides ample reason for the further elaboration of our standpoint. Our decision is also supported by the judicial practice which frequently tends to use this form of punishment when convicting serial murderers. This practice is graphically demonstrated by the fact that out of the nine verdicts that have been issued since 2005, only one (11%) was a determinate sentence, while the remaining eight (89%) was life without parole. It is likely that this practice will not change in the future, and accordingly most—if not all—of the convicted serial murderers will be sentenced to life without parole. The reasons behind the fact that this form of punishment has become so generally used are manifold: 1. serial murder is one of the most serious forms of homicide which 2. staggers the public but also demands their attention, and therefore 3. incites the public to doubt its

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sense of security. The fact that life without parole is so often and so *casually* utilized can be traced back to the termination of death penalty.

The events that led up to the *creation* of life without parole are summarized by Vókó: "in 1971, the punishment of life was introduced once again into the roster of criminal sanctions. The ban on death penalty was issued by Decree no. 23. of the Hungarian Constitutional Court, issued on 31 October 1990. The legislators—seeking to provide a response to criminal offences while closing the gap that was apparent between determined-length sentences, life sentences with the possibility of parole and death penalty—introduced the sentence of life without parole where the conditional release is not an option." [1: 217] Polt takes a more straightforward approach and states that "life sentence without providing the possibility of parole is an adequate substitution to death penalty, as the perpetrators are removed once and for all from society with no practical chance to earn their way back to it." [2: 29]

The trends in international criminal justice and the corresponding practice both seem to be heading towards this direction. Soon after the ratification of the European Agreement for banning death penalty in the 1990s, the sanction of life without parole was introduced. The legislators believed that societies would only support the termination of death sentence if a punishment that is severe enough would take its place.

The scope and number of the subjected prisoners have expanded manifold. According to the most up-to-date statistics,[3] in 2014 there were 27,000 convicts sentenced to life within the member states of the European Council. 22 of those countries that possess official statistics show an increase of 66% from 2004 to 2014 in the number of convicts sentenced to life without parole. The fact that there had been 7,500 convicts sentenced to life without parole in these countries is even more staggering. Most of them are held in the United Kingdom, Germany, Italy and Switzerland. [3: 34–35]

A Theoretical Approach to Life Without Parole

Ferenc Nagy analyses the function of the sentence from the historical aspect of criminal law. He emphasizes that within the hierarchy of criminal sanctions available in countries where the rule of law is more developed, deprivation of liberty is the leading and most widely used form of punishment with its harshest variant being the one that excludes parole. In this context, life without parole seems to "bridge the gap between capital punishment and determinate sentences." [4: 272]

Kabódi takes a systematic approach. In his opinion, this form of sanction cannot be regarded as loss of freedom, since when compared to the "temporary, transitional and »preparative« nature of regular (determinate) prison sentences, life without parole permanently deprives the subjects from their freedom. Life without parole—both in theory and in practice—is inadequate for fulfilling the standard goal of the convicts' successful reintegration. In short: from the aspect of penology, life without parole is not the deprivation of liberty." [5: 219] He believes that "it is as a matter of fact a new form of punishment which occupies a peculiar, value-changing status within the system of sanctions. It is less than

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[3]   Council of Europe Annual Penal Statistics (SPACE) August 2004 and July 2014.

instantly and directly taking away the life of the subjects, but more than the simply depriving them of their liberty." [5: 219] Pál Kiszely and István Nagy take a similar approach: they state that the introduction of the sentence has opened a new chapter in the history of Hungarian penology. [6]

The opinions of Hungarian experts on the topic seem to disagree when it comes to debating its necessity and availability. One of the extremes is represented by Kornélia Hagymási, who claims that in the case of convicts sentenced to life without parole, the "aim of imprisonment is imprisonment itself." [7: 68]

Another approach is taken by Garami, who emphasizes the cooperative, active and responsible activity of the prison service and the prisoner: "the greatest question that the prison service has to face is whether they can create a form of punishment that does not disagree with the principles set by the prohibition of torture and inhuman treatment and at the same time provides adequate security measures while also offering a viable, acceptable, albeit limited perspective for those who had been sentenced to life without parole." [8: 60] He highlights that the detention of such convicts has to be organized in a "special way that requires the individual application of the concept of minimal security, the establishment of a sense of responsibility, and allowing the convicts to make their life within better and that these efforts culminate in visible results. During the first period of serving the punishment, it is important to make sure that the convicts work out a notion of what might happen to them, what goals can they strive for and how these goals can be achieved." [8: 59]

Do Life Sentences without Parole have a Dissuasive Effect?

Although analysing this question as a whole is beyond the reach of our current paper, we still consider it indispensable to briefly investigate the issue. First of all, we would like to point out the fact that we were unable to find genuine academic studies or arguments for the supposed dissuasive effect of death penalty, which was the most serious form of punishment before the era of life without parole. Due to this reason, our approach is ceptical. Our opinion is largely the same about its substitution, the sentence of life without parole.

We accept the conclusions of Vont et al., who—based on the academic results of Hirsch—express their doubts about the empirical justification of the dissuasive effects of severe punishments. In order to obtain sufficient evidence, it has to be proven that during the perpetration of a crime, the criminals are aware of the severity of the sentence that would be imposed upon them, and no other reason but this severity itself is the factor that finally deters them from actually committing the crime. It seems that there is a connection between the certainty of the punishment and the ration of criminality; however, this link is a lot weaker when it comes to their severity. [9]

Lőrincz uses his own results to support the train of thoughts shown above. According to him, statistical data provides ample evidence for the non-existence of the link between the repressive periods of criminal policy and criminalism and the fact that the increase in imprisonments did not have any effect on the rate of crimes. We endorse his conclusion without reserve: "no repressive cycles have ever reduced criminality, but all of them had a significant negative impact on the prison service's chances in the successful reintegration of prisoners." [10: 121]

Are Imprisoned Serial Killers Dangerous?

Presumptions

In 1999, the year the sentence of life without parole came into effect, experts tried to predict the expected behaviour of those who had been subjected to this form of punishment. Since the beginning, Garami has emphasized that as long as psychological attributes are concerned, each subject is a different personality with different coping strategies and varied reactions to outside stimuli. When compared to other convicts however, there is a significant difference as the presence of futility, the *seemingly infinite nature of time*, coupled with the fact that these convicts have already been given the most severe punishment, leaves them with nothing to lose. These attributes raise the question of what reactions and perceived changes in the behaviour of convicts can be expected. According to the author, the most likely outcome is increased aggression, especially so because these people are already familiar with it due to the violent acts for which they were convicted. Out of recognition to this fact, it can even be assumed that these convicts will try to take hostages (staff members or fellow prisoners) in the unforeseeable future. [8]

During establishing the conditions for accommodation, József Csapó, the former Governor of the Szeged Strict and Medium Regime Prison—the first institution to be designated to admit prisoners sentenced to life without parole—focused on the likely dangers emanating from the introduction of the new legal institution. In his opinion, the "greatest, detention-related security risk is the fact that these people tend to feel like they do not have anything else left to lose. Though their behaviour might still have an effect on certain allowances within the prison, criminal law lacks any further sanctions […] We are unable to predict future events: we do not know what may occur three, five or ten years later, when due to the changes in the convicts' personality, they end up becoming aware of the futility of their situation." [11: 25]

Current Experiences and Relevant Scientific Results

Taking into account the hypotheses set by academic literature following the introduction of life without parole—according to which the frequency of events that threaten the order and/or security of detention will grow—we can conclude that fortunately, this prognosis has not been proven as of yet. What has been proven though, is the presumption that those sentenced to life without parole would perform self-harming acts and attempt suicides more often. [6: 11] This result corresponds to those of international research which emphasize the mentally destructive nature of the feeling of permanent insecurity. Lifers consider the authority who decided about their fate isolated, and although they are well aware of the control that limits them, the actual expectations regarding their behaviour is perceived and interpreted in a confusing way, leading to anxiety and aggression as primary consequences. [12] Pál Kiszely and István Nagy analyse the behaviour of prisoners who serve long sentences and state that "besides a generally balanced behaviour during serving a sentence, the most notable emotions from the prisoners are hopelessness and perplexity." [6: 11–12]

For decades, the international academic literature has been providing systemic reports about long-term (and life) sentences, and scientific studies that analyse the behaviour of prisoners sentenced to death.

In 2003, Sorensen and Cunningham compared the behaviour of 5,010 persons convicted for homicide housed in the state persecution system of Florida with the behaviour of 45,000 convicts sentenced to prison for different crimes. After the results had been processed, they came to the conclusion that "convicted murderers exhibited lower prevalence rates of disciplinary infractions and potentially violent misconduct, when compared to other inmates." [13: 239]

Marquart, Ekland-Olson, and Sorensen retrospectively reviewed (1974–1988) the prison disciplinary records of 107 convicted capital offenders in Texas who had been sentenced to life terms after their sentencing juries had rejected a *special issue* in the Texas capital-sentencing scheme (i.e., whether there is a probability that the defendant would commit criminal acts of violence that would constitute a continuing threat to society). These offenders, who had averaged serving 7.2 years on their life sentences, exhibited annual frequency rates of assault on an inmate with a weapon of 0.009—similar to the rate exhibited by inmates in the Texas prison population as a whole in 1986. [14]

Cunningham and Sorensen discovered largely identical results in 2007 when—also in Texas—they analysed the behaviour of 136 inmates serving life for homicide. Their results further enforce the aspect that the frequency of violent misconducts, attacks (14%) and acts of aggression (5%) is similar to the number of misconducts perpetrated by other prisoners. [15]

In the United States, the results of scientific inquiries performed in the correctional services of various states seem to completely agree with the results received from federal prisons. Cunningham, Reidy and Sorensen depicted in 2008—during a comparative analysis of federal prisoners—that 9% of prisoners convicted for homicide resorted to violent attacks, 1% of them ending with major injury. This is similar to the number and frequency of misconducts performed by other members of the prison populace. [16]

Even the somewhat conforming behaviour of the prisoners convicted for homicide is overshadowed by the integration of those once sentenced to death and their successful avoidance of open conflict within the prison regime. The much-quoted scientific results of Sorensen and Cunningham put down convincing evidence for the fact that former death-penalty convicts, the *worst of the worst* are not as far as threatening to the staff and the prisons in general as presumptions might have suggested. As a matter of fact, those prisoners who belong to the maximum security category attack members of the staff three times as often than those who had been sentenced to death earlier. Statistical analysis shows that out of 1,000 prisoners, 12.4, formerly death-sentenced inmates exhibited violence against staff members, this number is 37.6 in the case of maximum-security prisoners. [13: 262]

On the basis of their own inquiries and other comparative studies, the authors find it proven that "convicted murderers are neither likely, nor disproportionately likely to be involved in assaultive misconduct in prison." [13: 243]

The academic literature on the topic contains a research which goes even further by analysing a new method introduced in 1991 within the Potosí Correctional Center, located in Missouri state. In this maximum-security prison, death-sentenced inmates are not isolated from the general prison population within death rows, but instead housed in the same cells with nondeath inmates and are also able to interact in the yard and take part in other activities

together with the general population (school, sports, employment). Cunningham, Reidy and Sorensen compared the disciplinary records of the institution (ranging from 1991 to 2002) and discovered intriguing results: 1. Inmates sentenced to death and convicts sentenced to life without parole exhibited similar prevalence of violent misconduct; and 2. their rates were half of those of the parole-eligible inmates with whom they were side by side in the same facility during the same timeframe. [16]

In the inquiry, however, we were unable to find explanations to the surprising statistical results, therefore we solely consider them curiosities out of which scientific deductions cannot be drawn as of yet. Based on the numerous international results, Sorensen and Cunningham concluded that "most of these offenders have not engaged in serious prison violence and are not a disproportionate source of this type of misconduct that is of greatest concern to correctional staff." [13: 240]

Results of scientific inquiries conducted in Europe seem to agree with those of the United States. The Committee for the Prevention of Torture (CPT)—based on their analyses of 2015—emphasizes that "the experience in various European countries has shown that life-sentenced prisoners are not necessarily more dangerous than other prisoners." [3: 36]

This conclusion may serve as grounds for a more optimistic approach and may also provide a theoretical background for a more lenient system and a corresponding practice dedicated to those prisoners who are responsible for the most severe crimes perpetrated in Hungary. The situation in Hungary—as we have already depicted it in the previous — study is vastly different. It is of utmost importance to emphasize that following analysing the behaviour of serial murderers within Hungarian prisons, the overall results are a lot different and not nearly as favourable.

Employment and Activities

The treatment of prisoners serving a long sentence—with serial killers obviously included without exception—is a difficult and highly important task for the prison service, as the life of these convicts has to be organised within the framework of the most severe regime category. [8] Experts recognised this problem during the drafting phase of the legislation on the sentence of life without parole. Csóti already emphasized on multiple forums ten years ago that during "organizing everyday activities, we do not wish to exclude those who had been sentenced to life without parole from activities such as education, vocational and other forms of trainings and therapeutic activities, because we consider these devices indispensable. In our opinion, such activities engage the convicts, help them reduce their stress and facilitate the maintenance of their mental and physical health." [17: 28] Theoretical assumptions have only exerted a slight influence on the actual matters of everyday life since the greatest factor that influences this life is security. During analysing the experiences resulting from the first decade of life without parole Kiszely and Nagy add that "maintaining these security considerations is reasonable. Furthermore, upgrading the security conditions will even be more indispensable in the long run. We have to accept the fact that convicts sentenced to life will continue to *play chess* with the security system of the prison, and their attempts at getting to know it better are constant. Static security elements will have to be swapped for more advanced ones…" [6: 13] Apparently, reducing the security

risk to a minimal level has become the principal task. Kabódi states that "the necessity of organizing activities that help preserve the dignity of prisoners while providing a useful way to spend time is constantly conflicting with the requirements of the prison system which is aware of the increased security risks." [5: 219] Practice serves as evidence to his statement: out of the 15 incarcerated serial killers, currently only one is studying (No. 1) and another (No. 3) has managed to obtain a vocational qualification. The others—and among them all those who had been convicted to life without parole—have never participated in any form of education, training or vocational training whatsoever.

Internal Movement from the "Long-Term Special Section" (HSR)

When it comes to accommodating serial murderers, the most frequent location of placement is the Long-term Special Regime. In our opinion, their personality, length of incarceration and overall attitude towards the prison system justifies this—primarily security-related—decision. The relevant legislative background recognises this fact by declaring that "those convicts who are serving a life sentence or a pre-determinate sentence of at least 15 years and whose behaviour, attitude towards the security and operation of the institution and individual risk assessment results require special treatment and placement may be housed within the HSR section." [29: para 105 (1)] in order to facilitate their successful re-insertion into the community.

Out of the 15 serial murderers, all of those sentenced to life without parole (10 convicts) are being housed within the HSR section. During the establishment of this special section, the continuous safety of life and material goods was the principal condition. Under the professional leadership of András Csóti, the aim was to create a security system that completely satisfies these requirements. The best solution was considered to be accommodation within an individual and separate section where ample living space would ensure the successful execution of special programs and at the same time reduce stress while guaranteeing security. [17]

Based on practical experiences, Kiszely and Nagy point out that "by being situated within an enclosed and isolated place, the prisoners' desire for living a purposeful life eventually fades, giving way to the strengthening of their instinctiveness and social decay. The HSR section does not provide sufficient means for personal development and is isolated from the life lived by the members of the general prison population. As time goes by, this fact makes it even more difficult to relocate life-sentenced prisoners into more open regimes." [6: 12] Matovics also warns that in case of prisoners sentenced to life without parole, the "personal perception of time is demolished, inevitably causing damage in other functions. The monotony of life and time is an enormous issue which cannot be avoided in the case of those sentences that remain in effect until the death of the convict." [12: 101]

As time goes by, providing the possibility for a more dynamical movement within the HSR, the *general* strict regime or other regimes will continuously gain importance. The fact that life without parole prisoners located within HSR sections are without exception subjects of acts of self-harm, attempted suicides and perpetrators of misconducts such as "preparation for act of terrorism, escape attempts and preparations" can be considered a warning sign. These people become increasingly stressed and consider their situation hopeless. The issue

set forth by Pál Kiszely and István Nagy shows a vivid picture: first of all, "providing the means for maximum security during the life without parole prisoners'—who therefore have nothing to lose—accommodation and supervision is by no means futile", and secondly "it cannot be proven whether some convicts would actually not be suitable for replacement within »regular« sections." [6: 10–11] So far, we do not have practical experience that would support this claim, as no serial murderer sentenced to life without parole has ever been moved out of the HSR.

International practices regarding the accommodation of prisoners sentenced to life seem to disagree. In 2015, the CPT visited the prisons of a variety of European countries where prisoners sentenced to life are being housed. Their experience was that the general practice is to place these convicts together with other prisoners and their regime rules (their rights regarding employment, education, training and leisure activities) and the ways maintaining connection to the outside world are the same as of the *general* populace. In the Czech Republic, Lithuania and Slovakia life prisoners tend to spend the first 10 and 15 years in an isolated and specially designated cell. After serving these years, they are moved into *general regimes* where they are able to live together with other prisoners.

Certain countries including Armenia, Azerbaijan, Bulgaria, Georgia, Latvia, Moldova, Romania, the Russian Federation, Turkey and Ukraine employ a different practice, as they tend to keep these convicts separated and among very severe conditions.

We find it thought-provoking that all those countries—excluding Turkey—who employ either *severe* or a *mixed* way of isolation were members of the Eastern Bloc. Four decades of the Soviet ideological suppression, special moral approach toward sin and sinners and its dismissive and punitive practice probably still have an effect today.

Thought Experiment: Providing the Option for Release on Parole for Convicts Sentenced to Life without Parole

Expert opinions on the introduction of the release on parole for prisoners sentenced to life without parole seem to greatly differ.

A supporter, Mihály Tóth provides a very concise opinion about the punishment: "the isolation, the permanent and complete exclusion from society, the discrimination, the reduction of existence into its most basic, vegetative form—and foremost the conservation of this state without any hope for further change—cannot even be justified with the goals and role of criminal law and when viewed from the aspect of the legal systems of the third millennia, the whole context in general seems an inhuman, unjustifiable and thus unreasonable punishment." [18: 271]

We completely agree with the professional opinion of Ferenc Nagy, who besides presenting his approach also offers a solution to the issue: "it should be made possible that the judges responsible for the execution of prison sentences are given the chance to investigate the question and – after a multi-step procedure – may decide to grant or decline releases on parole." [19] quoted [7: 71]

Our approach is that the possibility of investigating the matter of granting release on parole after 40–45 years served, of course, does not mean that certain subjects would not be kept behind bars for the remainder of their lives. The sole aim of this suggested measure is

to enable the courts to investigate whether or not the goals of imprisonment have been met and proceed accordingly. Mihály Tóth takes a similar approach. He believes that it would be beneficial to introduce a system based on differentiation and proportionality that would provide a basis for multi-disciplinary periodic investigations where the convicts may at least recognise the fact that "instead of being buried alive for a lifetime, his fate would eventually be decided responsibly." [18: 272]

Renáta Uitz uses different wording but arrives at the same conclusion: she emphasises that providing the chance for revisions that are based on fixed and consistent rules would be nothing more than a symbol for a national criminal policy that treats the victim and the perpetrator as human beings. [20] Szilvia Antal, László Nagy and Ágnes Solt aim serious criticism towards life imprisonment based on their research on the topic: "we consider the current legal background regulating life without parole unacceptable, as it can actually be considered a «lite edition» of death sentences since it completely disagrees with constitutional principles and the civilized criminal justice of modern Europe. It can never be assumed during sentencing that the suspects and convicts in question would commit another crime in the future. It is highly doubtful to allow the court to completely and irrevocably set a bar against possible changes in personality." [21: 62]

In the international outlook of his study analysing life without parole from the aspect of human rights, Gönczi adds that the English and American professional literature considers the permanent privation of freedom a slower and actually more disadvantageous form of death sentences and equal to torture. He provides evidence to this claim by reviewing a startling occurrence: in Belgium, a court sentence from 15 September 2014 gave permission to a person—who was psychopathic but self-aware enough to be condemned—sentenced to life without parole for *euthanasia* with medical help, which is basically suicide with assistance. The convict chose death rather than the hopeless deprivation from freedom for the rest of his life. [22]

The suggestion of György Magyar contains strictness and humanity alike. In his opinion, it has to be made possible that "the law treats bestial and completely depraved people with the highest possible severity by subjecting them to the second most severe sanction after death penalty but also employing rules of humanity during incarceration. At the same time it should also set a period of 20–25 years after which the convict is heard by a court of three members who after gaining the opinions of the governor, experts and psychologists and analysing the subject's behaviour declare whether or not any hopes of further re-examinations and possible release should be kept alive. This procedure does not have to become a general practice, but the possibility should be left open. In regulating this by allowing the convicts to be heard by a commission each year after 20 or 25 years, thus allowing them to become aware that if their way of life within prison is acceptable, with no violent misconducts against staff members or fellow inmates, then there is a spark of hope remaining." [23: 130]

In their most up-to-date approach, the CPT seems highly supportive of the possibility of parole for convicts sentenced to life without parole. The document emphasizes that: "Prisons must be safe, secure and ordered, for the sake of all who become involved with them. Since being locked up, especially for an unknown period, is inherently damaging for almost all human beings, steps must be taken to minimise the damage. One important method of achieving this for life sentenced prisoners is to give them a definite date for the first

review for possible release, and a tailored individual programme which provides a realistic series of interventions for each prisoner leading towards that date." [3: 38]

The arguments of the suggestion's opposers is summarized by Mária Herczog: "Punishment is only one goal of detention, the other one being the fact that we are not to let these people back into the community […] From the aspect of the community, protecting fellow humans, potential victims, us all from people who are multiple recidivists or who premeditatedly murder multiple people (one or more persons) is a reasonable goal." [24] quoted [7: 71] András Polgár shares this view: "following the ban on death sentence, the only viable method of expulsing these people from society is this sanction." [25: 39] András Szabó takes a theoretical approach justifying its existence and its necessity: "The goal of the punishment is found within itself: public declaration of legal capacity, and retribution without regards to the goal." [23/1990. (X. 31.) AB határozat]

The gap between professional—and in many cases emotional—opinions seems to be unbridgeable as of yet. We hope that by collecting arguments for and against the introduction of probation, we can alter this static situation.

Does the Option for Probation in Case of (Serial) Murderers Sentenced to Life Without Parole Have a Right to Exist?

Currently, providing an answer based on the Hungarian practice to the possible dangers of releasing a serial murderer back into society is beyond our limits as in the last century no such convicts have been released from a Hungarian facility. Despite—or actually because of—this fact, we have to contemplate on the question of what would happen when an *irreparable* serial killer is unleashed once again back into society.

The proper way of analysing this issue would involve incorporating the questions of "what harm could we cause?" and "whose interest it is?" A brief contemplation on who would benefit from the introduction of the possible amendments to the regulation on life without parole and whom would it harm.

1. From the aspect of the state and its law and order: "We hold that the common goal of citizens and the State is to achieve the highest possible measure of well-being, safety, order, justice and liberty." [31] This unequivocally means that one of the principal tasks of the governmental administration is to uphold and increase public order and through this establish a sense of security within the citizens. The imprisonment of a large number of serial killers is without a doubt a great contribution to the increase of the subjective feeling of security. The criminal power of the state sets an example by permanently excluding from society those who commit a series of merciless and inhuman acts. What would the general populace's opinion be about the general extension of the option for parole? Introducing such a measure without due preparation would certainly create its opposition. However, we believe that by listing the advantages and disadvantages of this amendment and by adding that the option itself would not be mandatory, a positive change could be achieved within the majority of the population. Moreover, even the governments would profit from this step, as only the strong entities have the option to be permissive.

This issue is important from the aspect of our international renown. Ádám Békés points out that Strasbourg's decision[4] in which Hungary was criticized does not demand a complete ban on life sentences, it only doubts the way the version without the option for parole works – without any alternatives for judicial review. Békés also adds that the goal is not banishing life sentences, but to fine-tune the system of judicial review used during the execution of sentences regarding which we would like to note that a *successfully* served parole that would eventually lead to *release* is only an option and not a mandatorily prescribed *mitigation* for the benefit of the convict. The author also provides a suggestion for solving the issue: "the change seems pretty straightforward as the only thing that should be introduced is the option for release on parole. The system of conditions and requirements could be made more severe, it could also be prolonged as long as it stays predictable and pre-determined. The authorities should check whether the convict has changed and whether they show any signs of development that may facilitate their release." [26: 7]

2. From the aspect of society, the suggestion and the whole notion itself may seem completely irrelevant. Events happened decades ago are entirely unknown for the majority of people, as almost two generations have grown up since the perpetration. Contemporaries do not remember the names either, as the details of the tragedy are slowly eroded by time. After so much time, society does not want and—we have to accept this—does not wish to know anything about the perpetrators. This is what seems digestible and comfortable enough for them. The false perception of security resulting from the "If we do not talk about it then it does not exist" mentality is paired with utter contempt. Releasing the perpetrators—which would mean one person every 3–5 years—would not hit the *threshold* of society if the conditions are normal.

   It is certain that those former life sentenced (without parole) prisoners who may once get released on parole would pose no danger to society. Four or more decades behind bars causes such decay that physically prevents the ex-convicts from committing another violent crime or murder. It is very much likely that a 70-year-old offender who spent two-thirds of his or her life among increased security measures, performing simple manual labour within an enclosed and isolated environment is not even capable of sustaining him or herself. Without a family that supports them, without accommodation, material goods and knowledge of the ways of modern communications, these people will be institutionalized, which cost-wise would be a lot lighter burden than their lifelong incarceration.

3. For the Hungarian Prison Service, executing the sentences of life without parole is a mightily expensive undertaking due to the special sections, the constant supervision and training of the staff members. Maintaining this form of punishment is a *dead end* for the institutions. If current legislation remains the same, it is highly probable that new HSR sections will have to be built and/or the current ones expanded significantly. Another expensive investment in the future will be the introduction of nursing care for the elderly convicts serving their life without parole. Introducing the possibility

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4   The European Council of Human Rights condemned Hungary because of the violation of Article 3 of the European Convention on Human Rights 373593/10, 20 May 2014.

of parole for these persons would bring a significant change in the lives of staff members working in a HSR section since rewards, disciplinary measures would receive new meaning, greatly expanding their toolset.

4. In case of the prisoners in question, the amendment of the current legislation would once again bestow a different meaning on the notion of time. For civilian people, the timespan of four or more decades is largely beyond comprehension, but this is not the case with convicts. *Very far* is still a lot closer than *never.* There would be something to win and something to lose since the revision of parole would only mean the analysis of the time spent inside. This legal device would by no means be universally used! Even the mere existence of such an option would establish a real environment in which convicts can decide. Those who keep resisting—verbally or actively and dismissing the regime rules will of course not be favoured. Out of the *bestie mensch*[5] those who are able to shed some light on their human side would most likely be offered a chance to spend a few free years within a social or healthcare institution where they would eventually die.

Conclusion

We believe that from a systematic approach, the methods used during the execution of the serial killers' prison sentences can be compared to a litmus paper. They show the state of the criminal justice system, its rigidity and flexibility, the constant search for answers to pressing issues and our perception of human beings.

Our study is only the introductory part of a pathfinding effort. We endeavour to introduce the typification attempts related to serial killers, collect their primary attributes in order to get to know them better. We tried to give a brief introduction to the best-known international practices andBékés approaches and at the same time point out difficulties and novelties. We wanted to contribute to the effort of making serial killers more than just material for *tabloid journalism,* limiting viscerally emotional opinions when speaking about their punishment. We find it important to emphasize that based on their crimes, these prisoners well deserve to be called *bestial people,* but this is exactly why we consider this an issue. We speak about *bestial people,* but they are still *people.* Not even in their case we are allowed to adopt a form of punishment that would basically be the epitome of the "we do not allow them to live, but we do not let them die"–mentality which limits their existence to simple vegetation.

The analysis of the prison sentences imposed upon serial killers is inseparable from the critical examination of the sentence of life without parole itself. We have to observe the fact that 67% of the current serial killers (10 persons) are currently serving life without parole, while the rest of them (33%; 5 persons) have received a determinate sentence from the court. This also proves that the legislators—and of course the judiciary—are not entirely against the notion of life convicts returning to society (after having served their years). This issue should be—in our opinion—analysed from two aspects.

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5   Remark on the title of *Bestie Mensch,* authored by Thomas Müller. [27]

The first dimension would be the analysis of the legislative background. From the aspect of criminal pedagogy, we consider the termination of life without parole crucial. In our opinion, parole hearing should be reintroduced after 40 years have been served. *Time* as a dimension thus will once again receive significance and meaning, enabling the development of cooperation by creating the framework in which it is possible. We believe that this change would not limit the jurisdiction of the state, plus an elderly person who has already served 40 years poses no physical danger to society. We find it important to emphasize that the core of our suggestion is *merely* the introduction of the already widely used *mandatory parole procedure* for such convicts. The system would by no means be automatic: the subjects would have to provide certain and well established evidence that they are not potential threats anymore. (Of course, only the revision should be mandatory!) Among today's prisoners we can easily find convicts who loudly exclamate their murderous intent and malevolence: "I believe that not everybody has the right to live. […] May God save you from having to face me outside! Human eyes are not meant for witnessing such a dirty mess what I would create!" (No. 6) The doors of the prison will of course continue to stay shut for these convicts.

Therefore, in our opinion, incarceration for life may be a reasonable, even necessary measure in case of people who are responsible for multiple deaths, openly defy society and endanger its foundations. However, it has to be recognized that this does not and cannot mean the automatic legal exclusion from being released on parole.

The other aspect of the current situation—on the grounds of the sentence's existence—is filling the convicts *life within* with pedagogical content facilitating relocation between the regimes. It is in our best interest to find a harmony between security and the possibility of self-development but also to be able to provide the framework that is required by this endeavour. Solving this problem cannot be postponed any longer. Based on their practical experiences, Pál Kiszely and István Nagy argue that "our pedagogical toolset will soon empty out, therefore creating education plans that structure time and provide short and long-term goals for convicts whose chances for release are practically non-existent is becoming increasingly difficult. The fact that correctional pedagogy is a fundamental tool for personal development is something we cannot emphasize enough. It is not control and/or leadership, but a goal-oriented practice aimed at the creation of self-reliance. It is fairly difficult to conduct any goal-oriented activities where the goal itself is beyond the convicts' reach." [6: 12]

According to Hickey, monitoring and scientifically analysing the behaviour of serial killers in prison will play a significant role in crime prevention, the importance of which we are unaware as of yet. He argues that the convicts should be offered more options for treatments aimed at rehabilitation and their behaviour should be analysed extensively. This way we can catch a glimpse of the minds of these perpetrators and gain insight in the inner workings of their psyche. In certain cases, we may also receive information on how they have become murderers. This knowledge will facilitate finding grounds for prevention and treatment/intervention. [28]

On the occasion of the birth of the new law regulating the work of the Hungarian Prison Service, Lőrincz has *high hopes* for the current attempts of professional modernization. In his opinion, "prisons are one of the chief requirements of the state's criminal power and will continue to be one of the institutions of justice. […] This is the reason why the reformation and the changes in the foundations of the Hungarian Prison System receive great attention." [10: 348]

During planning the future of our profession, we have to be aware of the current state of the international environment that surrounds us, and raise awareness towards today's trends. We cannot overlook the fact that "the European criminal jurisprudence has advanced into a state where the sentence of life without parole has basically no right to exist. National presumptions agree that regarding the decisions on the termination of life without parole sentences, the occurring opinions and likely aversion of society cannot be taken into account." [1: 150] Although the actual solution to the problem is yet to come, professional debate and the collection of advantages and drawbacks have been ongoing for years. We agree with Vókó's forward-looking standpoint: "Recognizing practical questions will help the scientists, lawmakers and those who implement these laws achieve the best possible solution to professional questions. Progress is not to be sought after until science and practice had been harmonized. This is something we all endeavour to achieve. It is in our mutual interest to bridge the gap between the differing jurisprudential approaches and today's trends of criminal justice theory and practice on which the criminal law of the future and prison services can build upon." [1: 737]

We believe that our suggestions, coupled with performing the analysis of the serial murderers' situation behind the bars and suggesting answers to certain questions set by this paper while at the same time creating an index number by which inmate cooperation can be measured will contribute to a process of renewal and the establishment of a new framework of regulations and a method of execution.

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Security of E-Government Website Encryption in Germany and Hungary

Tamás SZÁDECZKY[1]

The paper deals with comparative research of the communication security of e-Government services in Germany and Hungary. The focus point of the research is to analyse the cryptographic security algorithms and protocols which encrypt communication in the relations of the citizen and a governmental body. The analysis includes the general e-Government portals, central web services, and specialised services, like taxation and criminal record extracts.

The actuality of the topic lies in the fact that the security of the citizens' personal data, used, stored and transferred by the governmental bodies can be in danger. Two examples are the loss of 25 million UK citizens' personal data in 2007 because of a failure of the UK Customs Service and the compromise personally identifiable information of 191 million US citizens, stored in the Voter Database in 2015.

The goal of the research is to check the current practice used for governmental communication, based on international standards and current practices.

The study compares the e-administration systems of a country of Central Europe which is considered less developed in e-government systems and processes than a Western European country. Based on the evaluation, which can be found at the end of this study, those persons who are responsible for the operation of such systems, can see the actual benchmarks of the communication security. So, this way they can learn about the usage of what communication protocols and cryptographic algorithms are recommended and under what settings.

Keywords: *Hypertext Transfer Protocol Security, information security, transport layer security, web-based governmental services*

Introduction and Parameters

A channel for the communication between the government and citizen is the data transfer between the e-government website and the citizen's web browser. There is always some personal data exchange, even if the registered client is only viewing the website. The way for securing this communication depends on the responsible government body. Their requirement is applied by the technical operator of the webpage. Even if some rules are set by policies, the practice shall always be evaluated e.g. during an audit, because otherwise, the government body cannot be sure about the level of security. [1] The mode of this evaluation is the technical check of the detailed cryptographic protocols used, including the used algorithms, parameters and key sizes.

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The Hyper Text Transfer Protocol Secure (HTTPS) communication is a secure way of viewing the web pages, which creates an encrypted connection between the web-server and the client-side browser. However, the protocols, which can be selected, algorithms and parameters are so diversified, that there is a big possibility of faulty or less secure settings. The user hardly ever has control over the security of the communication, and in most of the browsers the technical details are hidden, typically a blue or green bar or padlock is visible. In case of an analysis, we must use specialized tools, and we should check some parameters and settings in detail.

The first step of the security of the HTTPS is the security of the private key of the public key infrastructure (PKI), namely, it identifies the server itself. Here it can be expected the usage of RSA keys, the size of which are at least of the 2048-bit module and the usage of the SHA–256 hash algorithm or better. All this was met in all six analysed web services. The issuer of the certificate must be reliable. Consequently, it must be issued by a recognized certificate authority (CA) or certificate service provider (CSP); however, the issue is more complex than this, and a formal investigation of it faces problems. [2] It would be advantageous if instead of the standard Secure Sockets Layer (SSL) certificates, Extended Validation (EV) certificates would be used for e-government websites, as seen in the case of ELSTER Online. In the case of EV SSL certificates, the control of the identity of the applicant legal person is also carried out, not only the fact is checked, whether the given server is under the influence of the applicant or not. The EV SSL certificate is indicated by the green bar or the name of the certificate holder. The key and the certificate were appropriate in case of every investigated system. The visibility of unencrypted, standard and Extended Validation SSL certificates for the users depends on the browser. In the case of HTTP vs. HTTPS, the difference is hard to see for an inexperienced user. As recent studies have shown, the individual user's awareness is low in Hungary. [3: 65] The EV SSL certificate gives more assurance even for the inexperienced user, therefore increases trust in e-government services. Regardless, a higher level of security culture would also be inevitable from the aspect of cybersecurity. [4: 338]

The next step is the version of the protocol, which carries out the encryption, which can be SSL 2.0, 3.0, Transport Layer Security (TLS) 1.0, 1.1, 1.2. The first two protocols are vulnerable; it is highly unadvisable to use them. The usage of the TLS 1.0 should already be avoided, but unfortunately, in many cases, it must be used because of compatibility reasons. In the case of the TLS 1.1, the bad configurations need to be avoided. However, the TLS 1.2 is appropriate and secure in every setup. It can be mentioned, as a basic problem that only the outdated TLS 1.0 protocol was used in two Hungarian systems and the TLS 1.0 is still accessible in addition to the newer protocol in one-one German and Hungarian case.

From the key exchange procedures, the Diffie-Hellman key exchange (DHE) and Elliptic Curve Diffie-Hellman key exchange (ECDHE) should be supported, namely only these modern procedures make possible the support of the Perfect Forward Secrecy. [5: 581] The Forward Secrecy ensures that it is not possible to decode all earlier communication with the possibly hacked encryption key.

The size of the symmetric keys should be at least 128 bits in the case of Advanced Encryption Standard (AES) algorithm, the weaker, 56 and 112-bit key algorithms cannot be considered secure ones anymore. The Rivest Cipher 4 (RC4) algorithm is vulnerable, it is forbidden to use them, and the Triple Data Encryption Algorithm (3DES) is out-of-date and slow. Consequently, it should be avoided.

From the block cipher modes of operation, the usage of the GCM (Galois CounterMode) is advantageous, and it can be recommended over CBC (Cypher Block Chaining). [6: 549] The diffusion of the used algorithm is also an interesting question but, at the moment, it is not in our scope. [7]

With the usage of the HTTP Strict Transport Security setting, the non-encrypted communication with the server is not allowed, which is the most important parameter to be set. [8]

A Comparative Analysis: Germany and Hungary

Taking the above-written facts into consideration, the individual, selected general and local administration systems of the Federal Republic of Germany and Hungary have been compared in this paper; they have similar administrative functions. In all cases, the subjects of investigation were the systems, which carry out handling and transforming personal data and enabling customer relationship, at least in one of the countries. During the investigation, the communication protocol compliance assessment of the given system has been carried out. The sampled objects of the investigation are indicated in Table 1.

Table 1. *The analyzed systems.* [Edited by the author.]

Function	Hungary	Germany
General central or local e-government	general e-governmental client gate "Ügyfélkapu" in Hungarian	local administration portal, "Bürgerserviceportal" in German
Taxation services	not applicable: sent with a special application via the general e-governmental client gate	tax administration portal: ELSTER Online
Criminal records	specialized e-government service website "Webes ügysegéd" on "Nyilvántartó.hu" in Hungarian	criminal register excerpts on the website of the Federal Office of Justice, "Bundesamt für Justiz, Online-Beantragung von Führungszeugnissen" in German
Separate authentication service	Central Authentication Agent, "Központi Azonosítási Ügynök" in Hungarian	not applicable: authentication service is embedded in the services above, in most of the cases based on the new German personal identity card

As the reader can realize, the 1-to-1 mapping of those services is not possible, due to differences in the approach. At present, our research includes only the highest level of public services; however, as Soukopová, Nemec, Matějová and Struk shows, there are different aspects also to be considered in local level services. [9]

One sample is a general service, where more e-government services are available. Another example is the web service for the application of the criminal record excerpts. These were similarly available in both countries. Odd examples are the taxation services and a separate

central authentication service, which were available as a separate web-based service in one of the countries.

Methodology

During testing, we were carrying out two experiments. On the one hand, there were analysed the detailed characteristic features and parameters of the HTTPS communication of all the six systems in the system of the Qualys SSL Labs. [16] Qualys is one of the market leading manufacturers of vulnerability-analyzer systems. The Qualys SSL Labs service carries out detailed technical analysis regarding the algorithmic parameters and the HTTPS protocol of the web page, which provides the encrypted connection. The most important results of the several pages long, detailed analysis are summarized in Table 2. In case of every described website, the SSL Labs shows an overall result which is indicated in a separate figure. (Figures 1–6.) The overall rating provides a classification based on the most important security characteristic features which range from F (the worst) to A+ (the best). Here the goal is to achieve the best possible result, but the good result itself does not mean an assurance for meeting certain requirements yet. For example, the PCI DSS forbids the usage of the TLS 1.0, but the SSL Labs does not impair the assessment of the website when the TLS 1.2 is also accessible in addition to the TLS 1.0. During the testing, a control investigation was carried out to prove the most important findings of the Qualys SSL Labs. In the control tests, we were using a Firefox 51.0.3 browser, which ran under a Windows 7 SP 1 (Build 7601). In those tests, the encryption package, which was used during communication, had to be the same as the highest-level security of HTTPS communication setting recognized by the SSL Labs, which was primarily preferred on the server side. In addition to all this, we carried out a control-inspection regarding the issuer of the certificate, the modulus-size of the private key, and the other characteristic features of the certificate (the reliability of the issuer, the hash algorithm and the type of the validation).

General E-Governmental Client Gate (*https://gate.gov.hu*)

This website is the centralized identification system of the e-public administration. The clear majority of the e-government services, which are accessible in Hungary, carry out authentication through this system. One-factor exclusively, the knowledge-based identification is used here. The maximum period of validity of the password is two years.

The SSL certificate of the server has been issued by the Microsec e-Szigno SSL CA 2014, which is a qualified certificate authority in Hungary. The encryption package, which was used during the control inspection is TLS_RSA_WITH_AES_128_CBC_SHA, 128-bit key, TLS 1.0. The detailed results of the tests are in Table 2, and the summary is in Figure 1.
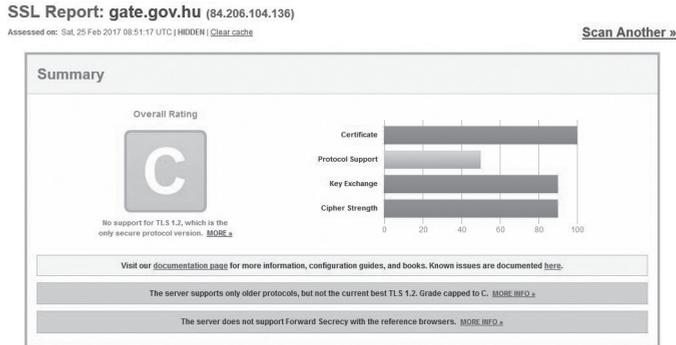
Figure 1. *SSL report of* gate.gov.hu. [17]

The Specialized E-Government Services of Hungary *(www.nyilvantarto.hu)*

The web-based administrative assistant (in Hungarian: Webes ügysegéd) hosted on www. nyilvantarto.hu is suitable for administration of criminal records, vehicle management and extracts from the register of births and marriages. Its identification is different from the identification system of the client gate. It uses the best TLS 1.2 for communication, but the earlier versions are also accessible. The identification happens by providing the username and the password combination, which are used in the client gate.

The SSL certificate of the server has been issued by the Microsec e-Szigno SSL CA 2014, which is a qualified certificate authority in Hungary. The encryption package, which was used during the control inspection is TLS_RSA_WITH_AES_256_CBC_SHA, 256-bit key, TLS 1.2. The detailed results of the tests are in Table 2, and the summary is in Figure 2.
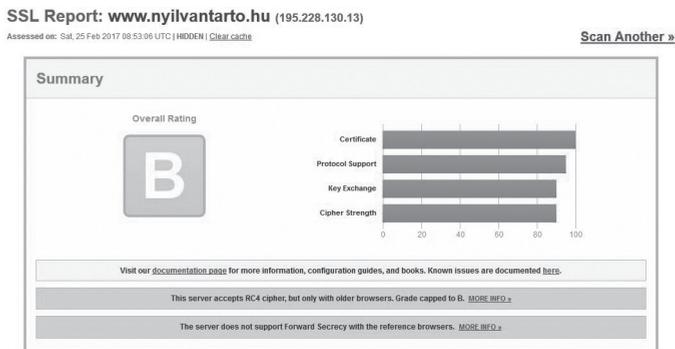

Figure 2. *SSL report of* www.nyilvantarto.hu. [18]

The Central Authentication Agent of Hungary *(https://kau.gov.hu)*

The Central Authentication Agent is an integrated identification interface of the regulated public management services, which is a legally defined service in Hungary. The identification

can be carried out by the client gate username-password combination and by the identification certificate which is stored in the new type Personal Identification Card. Unfortunately, for the time being, this latter function does not work. Despite the fact that it is the integrated identification platform of the future, it, unfortunately, uses the same outdated protocols and settings for securing data traffic, as the client gate does.

The SSL certificate of the server has been issued by the NetLock Expressz (Class C) Certificate Service Provider, which is a qualified certificate authority in Hungary. The encryption package, which was used during the control inspection is TLS_RSA_WITH_ AES_128_CBC_SHA, 128-bit key, TLS 1.0. The detailed results of the tests are in Table 2, and the summary is in Figure 3.
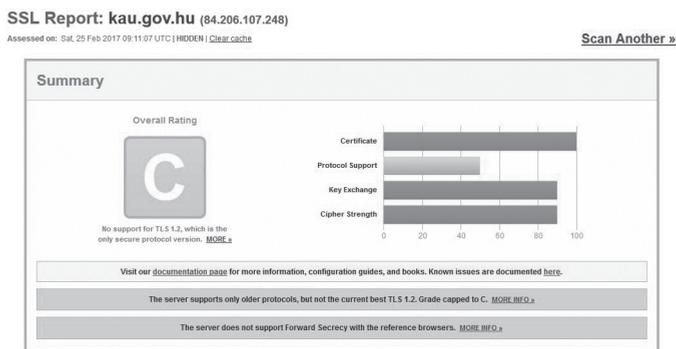

Figure 3. *SSL report of* kau.gov.hu. [18]

The Local Administration Portal of Germany (*www.buergerserviceportal.de*)

There is no such integrated, general e-public administrative portal in Germany which would totally comply with the Hungarian client gate described above. What we inspect here is the web page which assures access to the separate provincial administrative functions. Such type of services of the federal states can be accessed through this portal, but the system separates all these from each other. The communication operates with TLS 1.2 protocol and with appropriate, modern encryption algorithms. The applied certificate assures the highest accessible security. The only possible way to carry out the identification is using the authentication certificate, which can be found in the new type Personal Identification Card, ("der neue Personalausweis", nPA in German) and in the electronic residence permit, ("elektronisches Aufenthaltstitel", eAT in German). So that the citizen can use a two-factor identification. The certificate, which is stored in the chip on the ID card, can be accessed with the PIN of the holder. The use of ID cards causes a problem because services are not accessible in such an extensive way, as it would in case of the client gate, due to the fact that it is necessary for the citizens to have new types of Identification Cards activated with the new functions, and they also must own appropriate card readers. This identification method practically excludes from the service those foreigners, who live in Germany.

The SSL certificate of the server has been issued by the T-Systems International GmbH, which is a qualified certificate authority in Germany. The encryption package, which was used

during the control inspection is TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256, 128-bit key, TLS 1.2. The detailed results of the tests are in Table 2, and the summary is in Figure 4.
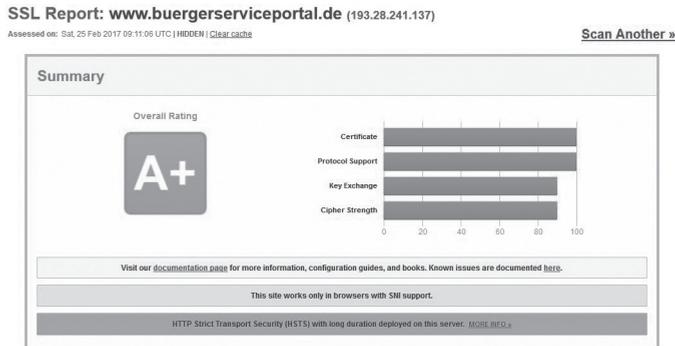

Figure 4. *SSL report of* www.buergerserviceportal.de. [19]

The Tax Administration Portal of Germany (www.elsteronline.de)

An integrated system of tax administration procedures is used at federal level in Germany. The personal income tax returns and other tax requests can be submitted through this portal called ELSTER Online. The encryption is even at a higher level than it is in case of the previous service, namely, here is used a 256-bit AES key. As it can also be seen in the tests, the setting of the web page is free from more significant configuration problems. The identification is carried out by default with the personal ID cards and the electronic residence permit, as it has been described earlier, but a soft certificate or a username-password pair are also usable.

The SSL certificate of the server has been issued by the Symantec Class 3 EV SSL CA–G3, which is a qualified certificate authority in Germany. The encryption package, which was used during the control inspection is TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384, 256-bit key, TLS 1.2. The detailed results of the tests are in Table 2, and the summary is in Figure 5.

Figure 6. *SSL report of* www.elsteronline.de [20]

The Criminal Register in Germany (www.fuehrungszeugnis.bund.de)

The request concerning issuing a criminal record is carried out electronically at federal level in an integrated system on the web page of the Federal Office of Justice. This web page uses the protocol and algorithm, which has already been described at the tax administration web page, here the security settings of the web page are also appropriate. The identification here is also carried out with using the nPA and eAT.

The SSL certificate of the server has been issued by the "Zentrum fuer Informations-verarbeitung und Informationstechnik ZIVIT CA–G01", which is a federal state operated certificate authority in Germany. The encryption package, which was used during the control inspection is TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384, 256-bit key, TLS 1.2. The detailed results of the tests are in Table 2 and the summary is in Figure 6.
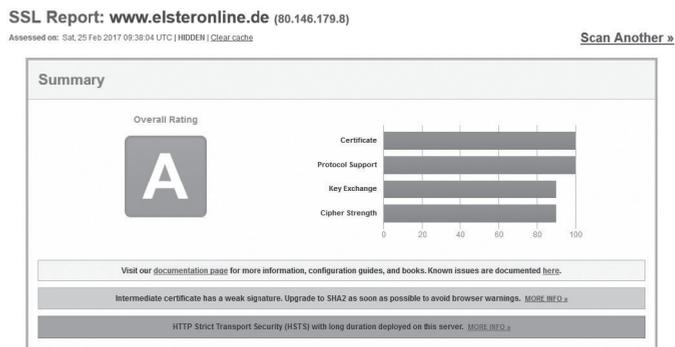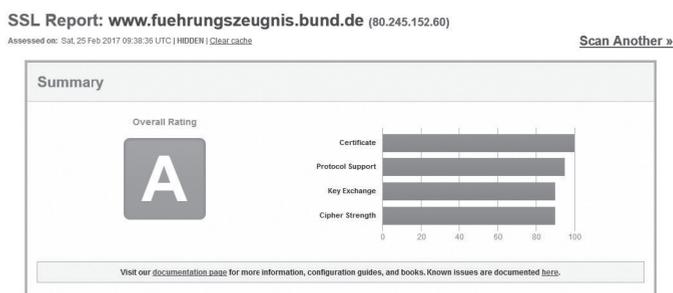

Figure 6. *SSL report of* fuehrungzeugnis.bund.de. [21]

Evaluation, Conclusions

The major problem we found during our analysis, is the fact that the user has lack of control and low level of awareness. Human-related errors are typical attack vectors. Therefore, these are also a focus topic in regulation. [10] However, the browsers are not supporting enough the users. The visibility of unencrypted, standard and Extended Validation SSL certificates for the users are shown in Figures 1 to 6. The EV SSL certificate gives more assurance even for the inexperienced user, therefore increases trust in e-government services. Although the IT security is a focus topic after the public administration reform in Hungary, the security awareness level will increase slowly, so public servants are also not likely to realize a problem from the service provision side. [11]

Figure 7. *Browser search bar when opening a site without encryption in Firefox.* [22]

Figure 8. *Browser search bar when opening a site with standard SSL certificate in Firefox.* [23]

Figure 9. *Browser search bar when opening a site with an Extended Validation SSL certificate in Firefox.* [24]

Figure 10. *Browser search bar when opening a site without encryption in Internet Explorer.* [25]
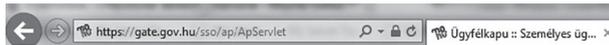

Figure 11. *Browser search bar when opening a site with standard SSL certificate in Internet Explorer.* [26]

Figure 12. *Browser search bar when opening a site with an Extended Validation SSL certificate in Internet Explorer.* [27]

It is hard for the user to see if the connection is HTTP or HTTPS. The difference is only a padlock logo somewhere. The details of the connection protocol are not visible for the user in Chrome. In the Internet Explorer, only the certificate details are visible. Firefox shows the most details. Therefore, this was used for the control measurement.

The overall rating of SSL Labs provides a classification based on the most important security characteristic features, which extends from F (the worst) to A+ (the best).

The comparison of the results of the tests is in Table 2. The analysis does not include vulnerability analysis, because it needs previous authorization to avoid legal impacts. With the usage of OWASP TOP 10 threat analysis, the risks from attacks, e.g. cross-site request forgery (CSRF), cross-site scripting (XSS) or SQL injection might be significantly lowered. [12]

Table 2. *Results of the analysis.* [Edited by the author.]

Country	Hungary			Germany		
Properties/Section	3.2	3.3	3.4	3.5	3.6	3.7
Certificate RSA key [bit]	2048	2048	2048	4096	2048	2048
Certificate hash-algorithm	SHA–256	SHA–256	SHA–256	SHA–256	SHA–256	SHA–256
Trustworthy CA	yes	yes	yes	yes	yes	yes
Extended validation	no	no	no	no	yes	no
TLS version	1.0	1.0; 1.1; 1.2	1.0	1.2	1.2	1.0; 1.1; 1.2

Country	Hungary			Germany		
Key exchange	RSA	ECDHE, RSA	RSA	ECDHE, DHE	ECDHE	ECDHE, DHE, RSA
Symmetric key [bit]	112, 128, 256	112, 128, 256	112, 128, 256	128, 256	128, 256	128, 256
Block cypher mode	CBC	CBC	CBC	CBC, GCM	CBC, GCM	CBC, GCM
RC4 support	no	yes	no	no	no	no
3DES support	yes	yes	yes	no	no	yes
Forward Secrecy	no	partly	no	yes	yes	partly
HTTP Strict Transport Security	no	no	no	yes	yes	no
Overall Rating (A+ is the best, F is the worst)	C	B	C	A+	A	A

The application of inappropriate protocols, algorithms, and parameters makes possible the attack against web pages or the communication channel; for example, the vulnerability of the TLS, which can be exploited, came to light in the last few years. Regarding the fact that the application of the out-of-date encryption poses a direct danger, concerning the data of the citizens, it is inevitable to change these into up-to-date solutions. All the investigated German e-government services almost totally comply with the security requirements of our era. The application of them do not pose any danger, at least from a technological point of view regarding the data of the citizens; still, here, too it is recommended to disable the TLS 1.0 and 1.1. The application of the ownership and knowledge-based multi-factor identification is to be especially highlighted instead of the exclusively knowledge-based identification. All this provides extremely high security, but unfortunately, it significantly limits the wide access to the e-government functions. A solution can be found to all this by the introduction of the digital identity card, which has been applied in Estonia; it is also accessible for foreigners and ensures full access to all e-public services. [13: 24] In contrast to Hungary, where there is no governmental requirement, guidance or best practice, in Germany it exists. Similarly to ETSI communication security guidelines, the Federal IT Security Agency of Germany (BSI) has specified the requirements. Both the minimum standards for SSL/TLS [14] and the BSI TR–03116–4 [15] requires the usage of TLS 1.2 with Perfect Forward Secrecy from 2015. However, the tested services did not fully comply (see Table 2). However, it is always recommended to use in the e-government services the standards and recommendations, which meet the international best practice, for example, the usage of the NIST and ETSI standards.

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[17] *Qualys SSL Labs.* www.ssllabs.com/ssltest/analyze.html?d=gate.gov.hu&hideResults=on
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[20] *Qualys SSL Labs.* www.ssllabs.com/ssltest/analyze.html?d=www.elsteronline.
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Power Sources of Military Helicopters

Béla VARGA[1]

In the early 1940s the first practically usable helicopters rose into the sky. Their importance was quickly recognised both by the military and civilian decision makers. A good summary of their most important advantage is the next quotation: "If you are in trouble anywhere in the world, an airplane can fly over and drop flowers, but a helicopter can land and save your life." (Igor Sikorsky, 1947) Just after their appearance it immediately became an urgent problem to replace the relatively low-power and heavy piston engines, for which the much lighter and more powerful turboshaft engines offered a good alternative. Significant improvement of helicopter engines, which has embodied mainly in power to weight ratio, thermal cycle efficiency, specific fuel consumption, together with reliability and maintainability, of course, has influenced the technical-tactical parameters of helicopters. In this paper I introduce the evolution of helicopter turboshaft engines, the most important manufacturers and engine types. Through statistical analysis I display what kind of performance parameters the helicopter turboshaft engines had in the past and have in the present days.

Keywords: *helicopter gas turbine engines, turboshaft, shaft power, specific fuel consumption, thermal efficiency, specific net work output, specific power*

The Beginning of the Gas Turbine Era

By the end of World War II, piston engine and propeller driven aircraft reached their performance limits. This meant their flying speed slightly exceeded 700 km/h. The flight altitude of an average fighter reached 12 km, the special reconnaissance planes could even reach 14 to 15 km. Good example for this process is one of the most well-known fighter plane of World War II, the Messerschmitt Bf 109, which went through numerous development phases. In Table 1 I have listed some of the main variants of this aircraft, illustrating that the more and more powerful engines did not yield a breakthrough result considering their flying speed.

Table 1. *Performance data of Bf 109.* [1]

Version	Year	Engine	Power (HSP[2])	Speed (km/h)
Bf 109B	1937	Jumo 210	720	466
Bf 109D	1938	DB 600	960	514
Bf 109E	1939	DB 601A	1175	569
Bf 109F	1941	DB 601N	1200	614
Bf 109G	1942	DB 605	1475	643
Bf 109K	1944	DB 605D	2000 (methanol injection)	724

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[2] HSP—Horse Shaft Power

These problems were already well-known even before World War II, although airplanes that time did not yet approached these limits. Using aerodynamic laws, it is easy to see that the necessary power is proportional with the cube of the flying speed, not to mention the ever-increasing amount of weaponry, which also required extra power. Accordingly, several researchers started to seek new directions for the aircraft engine developments. In the international arena, the British Frank Whittle's researches were particularly important, whose gas turbine engine in the 1930s (Figure 1, left) had all the components, which a modern gas turbine has.

Despite Whittle's leading role in gas turbine engine development, the first jet engine (Heinkel HE S3) built in an aircraft, was designed by Hans von Ohain. This engine pushed a Heinkel HE 178 aircraft, which accomplished its maiden flight on 27 August 1939.
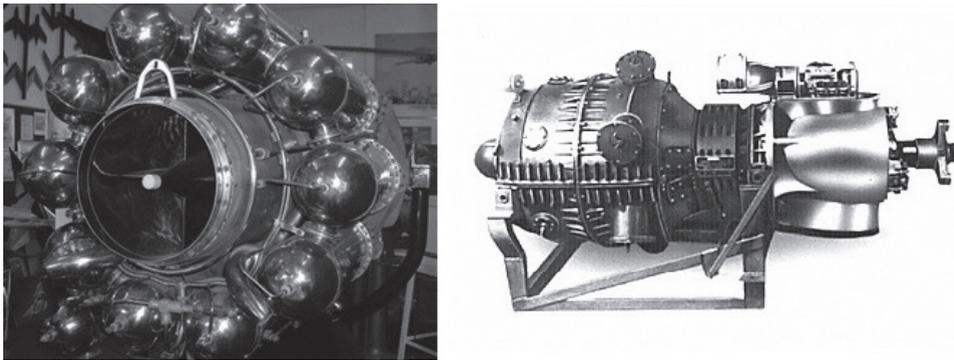

Figure 1. *To the left Frank Whittle's engine,* [2]
to the right Jendrassik's shaft power producing gas turbine. [3]

But we should not forget about the Hungarian György Jendrassik, who was already a prestigious engineer at the Ganz factory when he started to develop his gas turbine engine. The first of his gas turbine patents was dated on 12th March 1929. In 1938, his 75 kW power plant was the first in-use gas turbine in such a small size (Figure 1, right). His results worthily earned sensation. The machine achieved 21.2% effective thermal efficiency at 16,400 RPM[3] while it produced 72.5 kW shaft power. The maximum turbine inlet temperature was 475 °C and the compressor pressure ratio[4] 2.2:1. With such a low turbine inlet temperature and small size, nobody achieved such a high efficiency, not even today. This good efficiency was achieved by a heat exchanger[5] application. Both the axial compressor and the turbine had new unique solutions: both with slightly curved blades and stages having 50% degree of reaction.[6] Compressor efficiency was 85%, turbine efficiency 88%. [3] This gas turbine engine is also considered to be the ancestor of the shaft power producing gas turbines.

In the 40s, gas turbine engines (jet engines) appeared in such aeroplanes like the German Messerschmitt Me 262, Arado 234, or in the British Gloster Meteor (though the latter did not

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[3]   RPMc—revolutions per minute.
[4]   Compressor pressure ratio: the ratio of the air pressure exiting the compressor to the air pressure entering the compressor.
[5]   Heat exchanger: compressor air is heated by the hot exhaust gas flow in a counter-flow heat exchanger.
[6]   50% degree of reaction is when the pressure enthalpy change is equally shared by the stator and the rotor.

have a battlefield role). In the 1950s, the gas turbine era was definitely and irreversibly blown into the aviation.

Specialisation of Gas Turbine Engines

In case of the first practically used gas turbine engines the thrust producing component was in the rear section of the engine, namely the nozzle. Consequently, it became the first category of gas turbine engines, the pure single-spool turbojet engine, shortly pure turbojet. However, their further specialization started almost immediately and three more distinct categories emerged. These are turboprops, turbofans and turboshafts.

In Figure 2, three, though somewhat modified, but practically pure turbojets (with afterburner[7] and two-spool with afterburner) are seen from the top right to the bottom right. The last two engines to the right are turbofan engines, their bypass ratio is the difference between them.[8] The left-hand one is a low bypass ratio turbofan, which is nowadays the typical engine of multirole combat aircrafts and advanced training and light attack aircrafts.

The right-hand engine is a high bypass ratio turbofan which is used on passenger planes. However, the right-side engines also represent an evolutionary process; airliners went through this process from using pure turbojet (without afterburner) to high bypass ratio turbofan with 6–10 bypass ratio, significantly reducing their specific fuel consumption (increasing efficiency).

From the beginning of 1940s to mid 50s (pure turbojet)

From the early 50s (turboprop)

From mid 50s (afterburning)

From the late 50s (two-spool engine)

From the late 50s (turboshaft) helicopter

From the late 60s (low bypass ratio turbofan) From late 70s (high bypass turbofan) Fighters and early passenger planes → Modern passenger planes
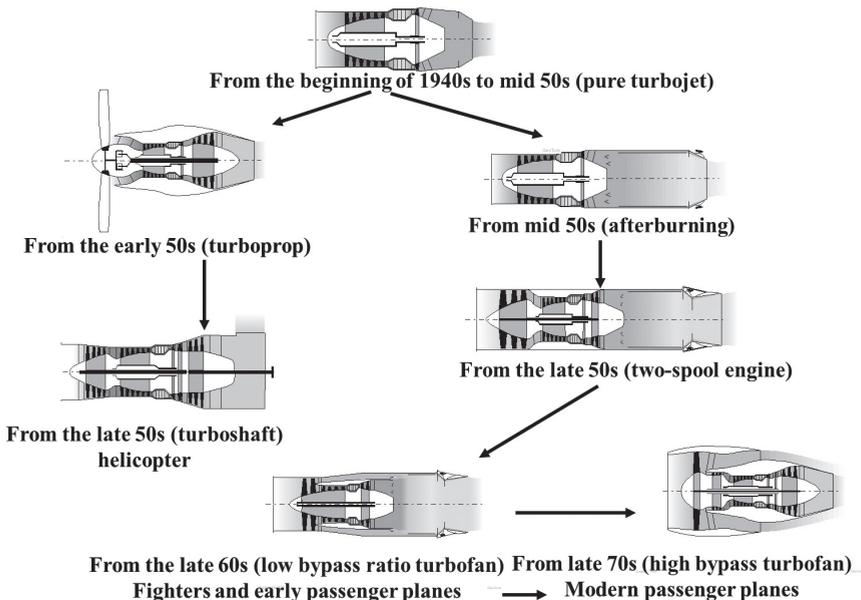
Figure 2. *Evolution of gas turbine engines.* [Edited by the author.]

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[7] Afterburner: thrust augmentation, achieved by injecting additional fuel into the jet pipe downstream of the turbine.

[8] Bypass ratio: the ratio between the mass flow rate of the bypass stream to the mass flow rate entering the core.

The left side turboprop engine is the engine of military transport aircrafts and short-range, typically small and medium-sized passenger planes. This is followed by a turboshaft, which is the typical engine of the helicopters.

Of course, the aircraft engines (maybe a more complex and appropriate expression would be propulsion systems) can be classified by how the thrust is generated, as shown in Figure 3. Thrust is the force which moves any aircraft forward, generated by the aircraft propulsion system. Different propulsion systems develop thrust in different ways, but all thrust is generated through the application of Newton's third law of motion, namely for every action there is an equal and opposite reaction. In any propulsion system some kind of working fluid is accelerated by the system and the reaction to this acceleration produces a force (thrust) on the system. Here we have to take into consideration that all aircraft propulsion systems can be divided into two basic components, such as a power generator and the accelerator. The power generator is actually, in most cases, a heat engine, which accomplishes well-known classical thermodynamic cycles, like Otto, Diesel, Brayton. The accelerator is the structural unit which provides the thrust force, i.e. propeller, helicopter rotor, nozzle, fan stage or a combination of these items. A general derivation of the thrust equation shows that the amount of the generated thrust depends on the mass flow rate through the propulsion system and the difference between exit and inlet velocity (acceleration) of the working fluid.

It means that the principle of thrust derivation is the same in any case despite differences in structure of propulsion systems. But by the differences we can define some typical propulsion systems.
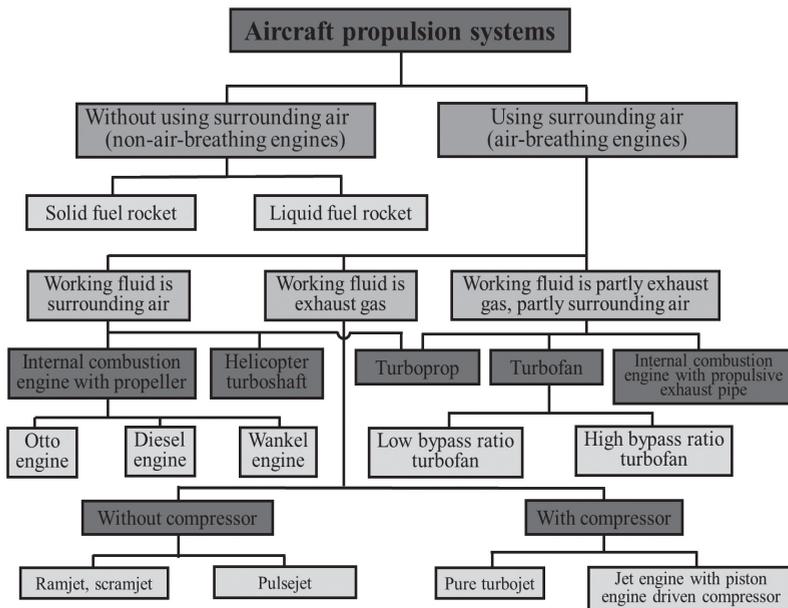

Figure 3. *Classification of aircraft propulsion systems.*
[Edited by the author.]

From this point of view, aircraft (air-breathing) engines can be classified into three main categories, see the light brown row in Figure 3. Today the non-air-breathing engines can be excluded as aircraft propulsion systems:

- propulsion system where the accelerated working fluid is the surrounding air;
- propulsion system where the accelerated working fluid is the hot exhaust gas of the heat engine;
- propulsion system where the accelerated working fluid is partly the surrounding air partly the hot exhaust gas of the heat engine.

Apparently, gas turbine engines (turbojet, turbofan, turboprop, turboshaft) appear in all three of the aforementioned categories.

The Born of Shaft Power Producing Gas Turbine

Already in 1943, the possibility of using gas turbines to produce shaft power was considered in Germany to install them in newly-developed armoured vehicles, mainly in tanks. The design and construction of several more or less similar engines lasted from mid-1943 to early 1945. They were developed by Adolf Müller and signed from GT 101 to GT 103. With them a new category of gas turbines was born namely the *turboshaft*. The reason of this development was that the power to weight ratio of this gas turbines was much better than that of the piston engines with similar shaft power. Of course, there were disadvantages of the plan, too. The most significant is the expected bad thermal efficiency, which at that time was predetermined by the low compressor pressure ratio, at about 3:1, exacerbating by the low component efficiencies which further deteriorated the thermal efficiency. This, of course, caused high fuel consumption. This was somewhat counterbalanced by the fact that the lower quality kerosene used in gas turbines was more available than petrol at the end of the war, when Germany suffered from lack of fuel.

Another typical problem came from the fact that gas turbines typically work at high RPM. At low engine speeds, their torque is also low. Maintain a relatively narrow high-speed range and provide sufficient torque for the vehicle can be solved only with a complicated transmission and clutch system. The free-turbine (or with other words power-turbine) solution was already present in the first plans but when the load decreases, the overrun of the free-turbine is unmanageable.

Another idea was to drive a generator by the gas turbine shaft power to provide the required electric power for an electric motor. Later this was dropped and GT 101 (Figure 4, left) became a modified version of a BMW 003 aircraft gas turbine engine. The most important change is that the number of turbine stages were increased from one to three, and the extra stages added extra power to the gas generator shaft.[9] However, the placement of the new power source in the vehicle caused serious problems, the delivered 857 kW shaft power at 450 kg mass was impressive enough comparing to the 462 kW and 1200 kg mass of the Maybach HL230 P30 piston engine. Another advantage was that the relatively heavy

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[9] Gas generator: the core of the gas turbine engine: compressor, combustor, (compressor) turbine.

gas generator rotor (compressor and turbine) operated as a flywheel improving the off-road ability of the vehicle through terrain obstacles.
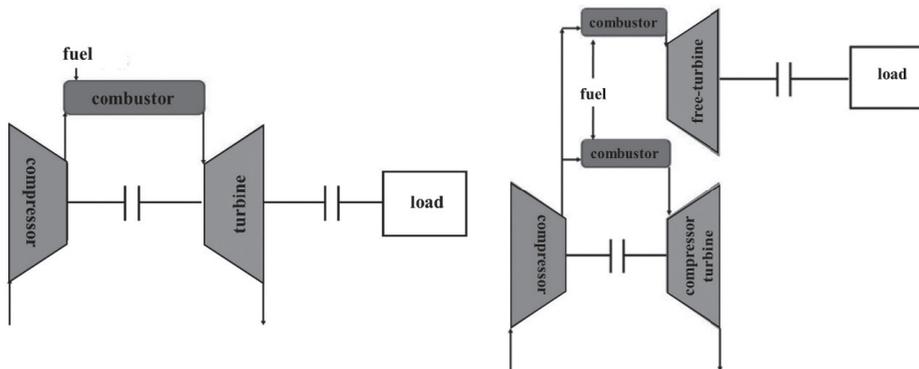

Figure 4. *Left: the schematic of GT 101 gas turbine engine with undivided turbine (no free-turbine); right: GT 102 gas turbine engine with extra combustor and free-turbine.* [Edited by the author.]

In case of GT 102 engine (Figure 4, right) a completely different concept was followed. The two-stage free-turbine was completely separated from the gas generator unit. Interestingly, it had its own combustor, which was air supplied by the compressor bleed air[10] of the gas generator unit (30% of the total air supply). The over-run of the free-turbine in unloaded state was solved by releasing the working fluid to the surrounding atmosphere.

The GT 103 gas turbine engine was actually the version of the GT 102 with a heat exchanger. The idea was logical as the compressor of these engines had very low compressor pressure ratio and consequently low compressor exit temperature. The temperature of the exiting exhaust gas was much higher and could preheat the compressor air before entering into the combustor, significantly decreasing the fuel consumption. [4]

Although the above-mentioned engines were suitable to install into combat vehicles and preparations were made to do it, but the continuous deterioration of the military situation made it impossible to launch the serial production.

The Adaptation of Shaft Power Producing Gas Turbines in Aviation

In the late 40s and early 50s, turboshafts also appeared in aviation. The first low performance, so-called Auxiliary Power Units (APU) appeared on the board of aircrafts; their task was to start up the main engines of the aircraft, supply the on-board electrical energy system, and supply air to the air conditioning system.

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[10]   Bleed air is compressed air that is taken from the compressor stage upstream of the combustor.

In the second half of the 1950s, when helicopters achieved their adulthood, and it became an urgent problem to replace the relatively low-power and heavy piston engines, for which the turboshaft engines offered a good alternative. Only some types of light helicopters (e.g. Robinson) are exceptions, in which the piston engine has remained the power source. The first type of gas turbines used in helicopters was the Turbomeca Artouste turboshaft in 1950 (Figure 5), originally intended to use as an auxiliary power unit.
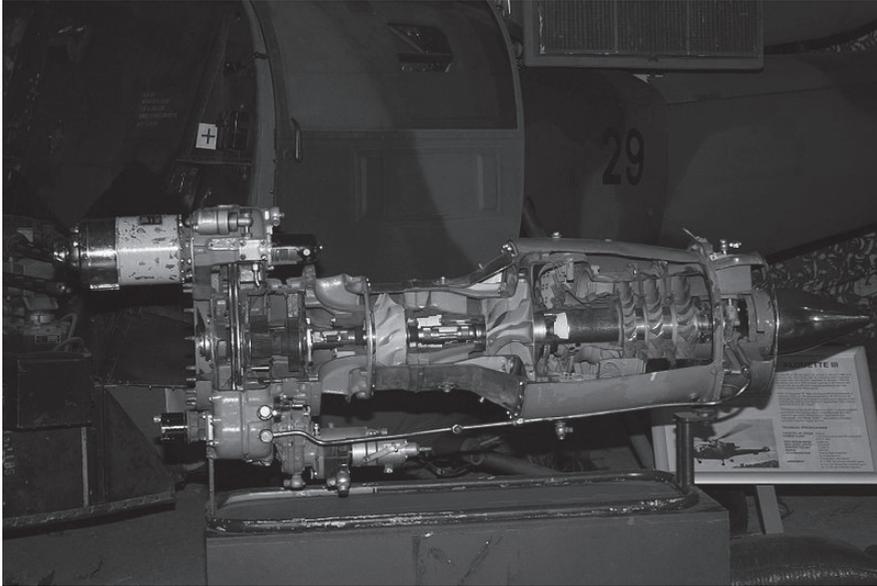

Figure 5. *Turbomeca Artouste, the first turboshaft used in helicopters.* [5]

This engine was capable of up to 210 kW shaft power and was incorporated into a number of helicopters such as Aérospatiale Alouette II, Aérospatiale Alouette III, Aerospatiale Lama, Aerothéque AC-14, Atlas XH-1 Alpha, IAR 317 and aircrafts like Handley Page Victor, Hawker Siddeley Trident, Vickers VC10 as auxiliary power units. [5]

Of course, the great powers did not wait idly and the developments started. In the United States, Lycoming with Anselm Franz, the creator of the Jumo 004 gas turbine engine in Nazi Germany, began to build a 373–522 kW turboprop engine family on behalf of the US Air Force. The T53 and T55 turboshaft engines came from this project. The T53 were built into helicopters or aircrafts such as Bell UH–1 Iroquois and AH–1 Huey Cobra and Grumman OV–1 Mohawk airplane. [7]

It should be noted that there is a considerable structural similarity between turboprop and turboshaft engines. A number of manufacturers produces turboprop and turboshaft variants of a particular type of gas turbine engine. However, there are two fundamental differences between these two categories. One is that in case of turboprops in general (except small turboprop aircrafts) a small portion of the energy of the exhaust gas is converted into thrust in the nozzle, thereby providing 10–15% of the total thrust by the nozzle instead of using additional turbine stage(s) or by modifying the turbine to allow the remaining part of energy to be converted into shaft power. The other difference is that in turboprops the propeller and

the transmission are structurally part of the engine. In case of helicopter turboshafts, the main gearbox is structurally connected to the airframe and the thrust force is transferred directly to the airframe, not to the engine.

In the early 1950s, General Electric also received a $ 3 million contract from the Government of the United States to develop a new light-weight, reliable gas turbine engine suitable to use as a helicopter power source. The secret program was launched under the name of XT–58 and the final result was a 596 kW shaft power turboshaft engine (Figure 6); its mass was only 181 kg.

This engine was further developed by 1957 and its output shaft power improved to 783 kW and its mass decreased to 114 kg. This year the piston engine of the Sikorsky HSS–1F helicopter was replaced by two T58 turboshaft engines and became the first US gas turbine powered helicopter. Recognizing the practical importance of the new development, a number of US helicopter manufacturers (Sikorsky, Kaman) built the newly developed T58 engine in their helicopters. [9]
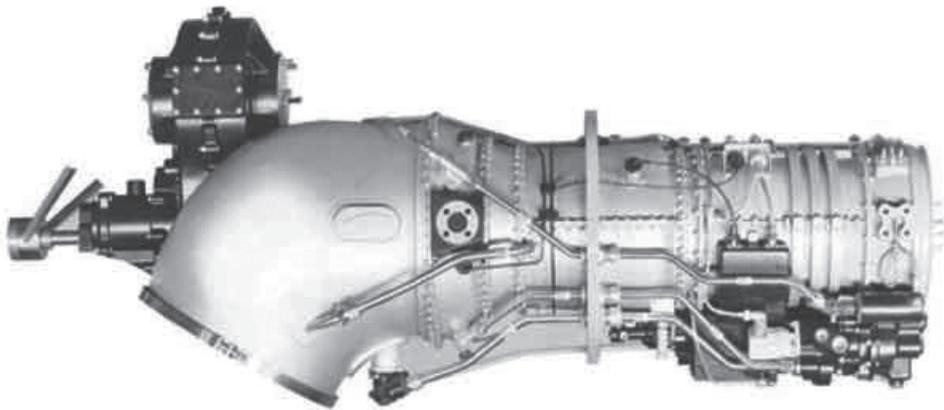

Figure 6. *The XT–58 turboshaft engine is mostly identical with the arrangement used today.* [9]

The first Soviet second-generation helicopters appeared in 1957. This Mi–6 was a heavy transport and a troop carrier helicopter. In the second half of the 50s Mikhail Leontyevich Mil, the head of the Mil design bureau decided to design a revolutionary new helicopter for the replacement of the that time already obsolete Mi–4 helicopters in the medium-size transport helicopter category.

On 20 February 1958, the Council of Ministers of the Soviet Union adopted this proposal and ordered the development of a helicopter capable of carrying 1.5 to 2 tonnes of payload with a V–8 type designation, which would be equipped with an Ivchenko AI–24V turboprop engine modified for use on a single rotor helicopter. The single-engine V–8 helicopter first flew on 24 June 1961. Recognizing the disadvantages of the AI–24V engine, the Izotov Engine Design Bureau was instructed to develop a truly helicopter application optimized gas turbine engine. The TV–2VM and D–25V engines used for Mi–6 were originally designed for fixed wing aircraft. The new TV2–117A turboshaft (Figure 7) and the VR–8 main gearbox

designed by the Izotov Bureau was delivered in the summer of 1962. The new engine produced 1118 kW shaft power at take-off rate of power with relatively good specific parameters. [10]
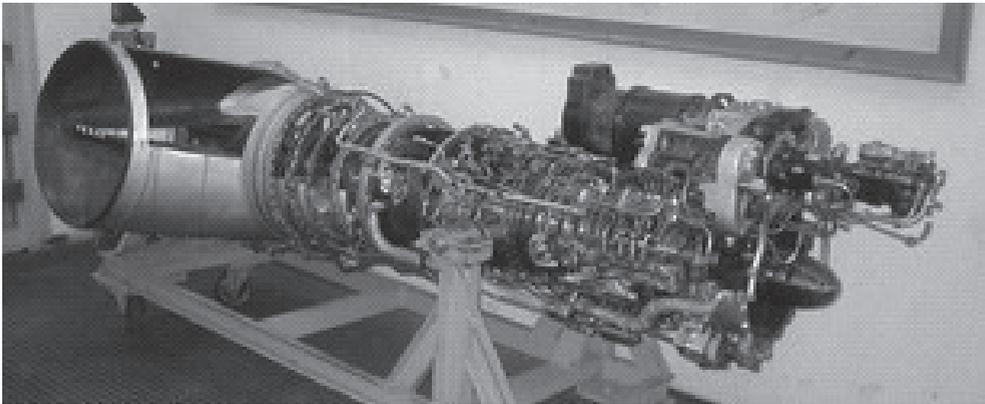

Figure 7. *TV2–117A, the first Soviet turboshaft engine designed for helicopter application.* [Author's own photo.]

The TV3–117 turboshaft family became the power source of the next-generation Soviet helicopters. Its structural layout is similar to that of the TV2–117A engine, apart from the two additional compressor stages, which provide higher compressor pressure ratio (9.4:1 compared to 6.6:1), and the mass flow rate[11] (8.7 kg/s compared to 6.8 kg/s) providing higher shaft power (1640 kW compared to 1108 kW). These engines were used in almost all Russian medium-size transport and attack helicopters: Mi–SMT, Mi–17, Mi–14, Mi–24, Mi–25, Mi–35, Mi–28, Ka–27, Ka–28, Ka–29, Ka–31, Ka–32, Ka–50 and Ka–52, demonstrating their reliability. [6]

Of course, the urgent claim for these new engines was soon to be targeted by most engine manufacturers and today 10–12 of them dominate this segment of the market. The number of their types and their modifications is almost uncountable. They can be found in Reference [7] (and Annex 1) where we can track the most important manufacturers, their products and the most important parameters of their engines.

In this period the classical principle of this gas turbine category (Figure 8), which was mostly embodied in the free-turbine application, became quite common. The so-called gas generator rotor (compressor and compressor turbine) is not mechanically connected to the free-turbine, which allows independent free-turbine speed from the gas generator unit speed. Accordingly, the free-turbine has only gas dynamical connection with the gas generator unit, i.e. the residual energy of the hot gas is utilized in the free turbine, ensuring the required shaft power.

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[11]   Mass flow rate: amount of air flows through the engine per second (kg/s).
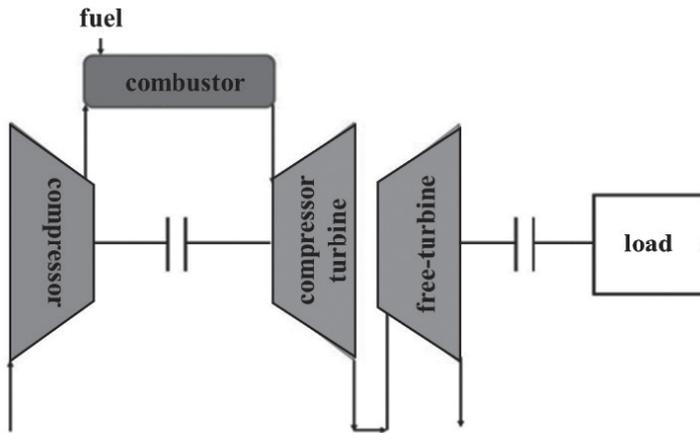
Figure 8. *The schematic of turboshafts used today.* [Edited by the author.]

Though the principle has not changed since the 1950s, helicopter turboshafts have undergone through significant development. The layout has changed as the reverse-flow combustor became more common (Figure 9/a; d), some of the turbine stages were incorporated into the ring-like inner combustor case (Figure 9/a; d). In many cases, a front drive is used (Figure 9/a; c), so that the first reduction gear stage would remain part of the engine itself (Figure 9/a; b). As a result, the engines became more compact and lighter. Their specific parameters and thermal efficiency has improved despite the fact that the aforementioned structural changes often had a negative effect on their component efficiencies and through it on their thermal efficiency. In Figure 9/a; b; c the gas generator (blue) and the free-turbine (brown) is clearly divided, which is shown by their different colour.

The RTM 322 engine schematics, shown in Figure 9/d, illustrates one of the most typical structural solutions. The compressor's 3–5 axial stages are followed by a centrifugal compressor stage mounted on the same shaft. The reason for using a centrifugal stage is that it can replace 4–5 axial stages.
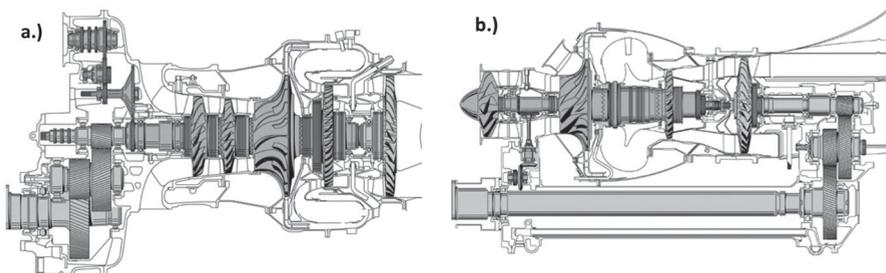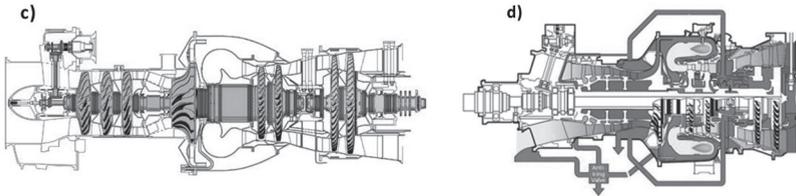
Figure 9. *Schematics of different turboshaft arrangements.* [11]

This solution reduces the length of the engine. On the other hand, though the centrifugal compressor usually has a lower polytrophic efficiency than the axial compressor, but due to the low air mass flow rate, the short blade length of the last axial compressor stage would produce an even worse polytrophic efficiency than the centrifugal compressor. The reverse flow combustor also reduces the length of the engine, although it slightly increases the combustor pressure loss. The turbine blades are cooled in the first stages, though the turbine inlet temperature is lower than in other gas turbine categories. Free-turbine blades are generally not, or only minimally cooled. The exhaust pipe system serves only to allow the exhaust gas into the surrounding atmosphere.

Figure 10 also depicts a modern helicopter turboshaft engine, which is the product of the MTR consortium and doubly built in, powers the Eurocopter Tiger helicopter.
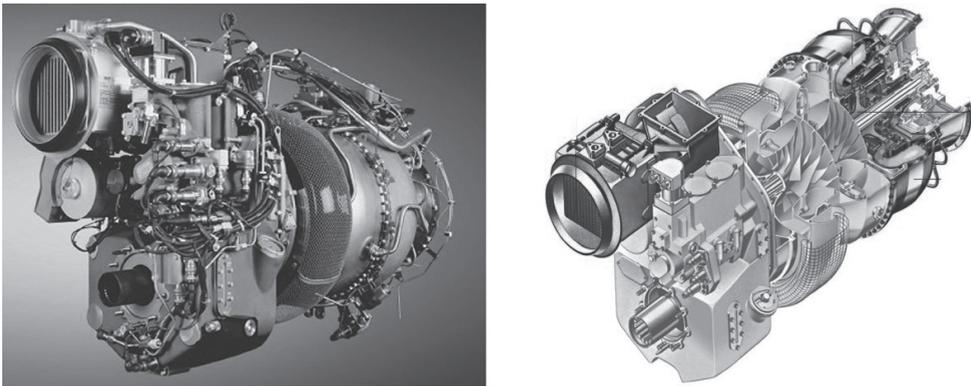
Figure 10. *MTR 390, the power source of Eurocopter Tiger.* [12]

Compared to the previous layouts, its novelty is that even the first axial stages are replaced with a centrifugal stage. This provides an even shorter and compact layout, reduces the tendency of compressor stall,[12] and achieves a satisfactory compressor and turbine efficiency at low air mass flow rate. Table 2 illustrates the performance, mass and size data of the two variants.

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[12]   Compressor stall: the flow separation in the compressor due to the deformed velocity triangles.

Table 2. *Most important data of two MTR 390 engine variants.* [12]

MTR 390 engine variants Uninstalled, ISA[13] H = 0 m	MTR 390–2C	MTR 390–E
Measure of the rate of power (kW)	958	1094
Emergency power (30s) (kW)	1160	1322
Maximum continuous power (kW)	873	1000
Specific fuel consumption (take off) (kg/kWh]	0.284	<0.299
Specific fuel consumption (max. cont.) (kg/kWh)	0.280	<0.293
Air mass flow rate (take off) (kg/s)	3.2	3.6
Compressor pressure ratio (take off)	13	14
Free turbine RPM (1/min)	8320	8320
Length (mm)	1078	1078
Width (mm)	442	442
Height (mm)	682	682
Mass (kg)	169	<179

Statistical Analysis of Helicopter Turboshaft Engines

When we examine the development of the category, of course we have to consider many factors. These include specific fuel consumption (ratio of fuel consumption to shaft power), specific net work output (ratio of shaft power to air mass flow rate), specific power (ratio of shaft power to engine mass), reliability, operability, which of course affect the tactical-technical operation of helicopters.

Diagrams from Figure 11 to 14 display the different engine performance features as a function of shaft power processing the Annex 1 with Excel function manager. What is apparent at first sight in Figure 11 is that in terms of engine shaft power, the helicopter engines can be divided into three distinct categories by their shaft power, with some well-perceived gaps among them. The smallest performance category provides up to 200–800 kW take off power. The medium performance category includes power plants ranging from 1000 to 2200 kW, while in the large category there are 2500–3700 kW shaft power outputs. Obviously, this latter category of my analysis contains the fewest pieces. This does not mean that there are only that many engines in this category but due to the relatively small number of *heavy* transport helicopter types and the relatively low production number, the choice is not so numerous like in small and medium categories.

Of course, in some cases, we can find some data out of the aforementioned interval. The T64–GE–100's 3228 kW performance and 13.3 kg/s air mass flow rate is high, but it is also dwarfed by the Mi-26 helicopter's D–136 engine with 8501 kW output. Due to its relatively high air consumption, its specific fuel consumption is also quite good (0.266 kg/kWh).

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13   ISA—International Standard Atmosphere.
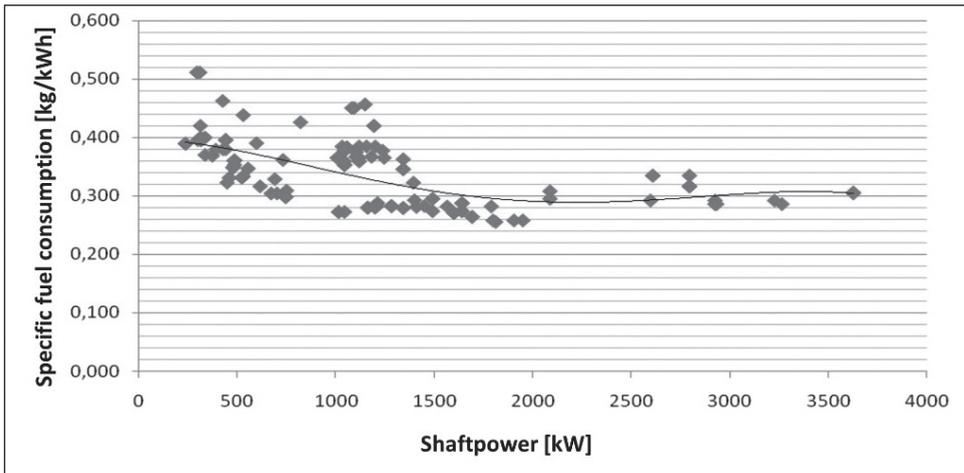
Figure 11. *Specific fuel consumption vs. shaft power diagram.* [Edited by the author.]

However, in the low shaft power category we can also meet specific fuel consumption values around 0.5 kg/kWh. For example, the Mi–2 helicopter's GTD 350, which is well-known in our practice, has a 0.489 kg/kWh specific fuel consumption which is extremely high. This can be explained by the age and relatively small size of the engine. In most cases the available data for the analysis is the specific fuel consumption, but this can easily be converted into thermal efficiency using Equation 1 and 2.

$$\eta_{th} = \frac{P[W]}{\dot{Q}_{in}\left[\dfrac{J}{s}\right]} = \frac{P[W]}{\dot{m}_{fuel}\left[\dfrac{kg}{s}\right] \cdot FHV\left[\dfrac{J}{kg}\right]} \text{ míg a } SFC = \frac{3600 \cdot \dot{m}_{fuel}\left[\dfrac{kg}{s}\right]}{P[kW]}\left[\dfrac{kg}{kWh}\right] \quad 1.$$

$$\eta_{th} = \frac{1}{\dfrac{SFC\left[\dfrac{kg}{kWs}\right]}{3600} \cdot FHV\left[\dfrac{kJ}{kg}\right]} = \frac{3600}{FHV \cdot 43217{,}08}[-] \qquad 2.$$

Where:
- η_{th}: thermal efficiency [–];
- P: shaft power (kW);
- $\dot{Q}_{in}$ input heat flow (J/s);
- $\dot{m}_{fuel}$ fuel mass flow rate (kg/s);
- FHV: fuel heating value (J/kg);
- SFC: specific fuel consumption (kg/kWh).

Of course, Equation 2 gives the correct result if the specific fuel consumption is replaced by kg/kWh according to the derivation. For the conversion, the fuel heating value is still requested. Here, the standard 18,580 BTU/lb was adopted from the Boeing's *Jet Fuel Characteristics* workbook, which corresponds to 43,217,080 J/kg after the unit conversion. [8]

If we examine the diagram in Figure 11, it is interesting to note the nature of the average specific fuel consumption vs. shaft power curve. Considerable change can be seen at higher shaft power. The average specific fuel consumption decreases from about 0.4 kg/kWh to 0.3 kg/kWh. Converting them to thermal efficiency, the related efficiencies are 21% (0.4 kg/kWh) and 28% (0.3 kg/kWh) giving a considerable difference.

This, of course, is only indirectly related to shaft power. The real reason is that generally higher shaft power needs larger geometric dimensions, which results in better component efficiencies (compressor, combustor, turbine efficiencies, for example due to the relative smaller blade tip clearances). This is even more true if the maximum air consumption is at least 30 kg/s or so like in turbofans. Nowadays their thermal efficiency is well above 40% at maximum rate of power. At the same time in case of helicopter engines, thermal efficiency around 30% is reasonable. We can conclude, that the thermal efficiency of helicopter turboshafts is generally between 17% and 32%. Worse thermal efficiency (higher specific fuel consumption) is expected at smaller and (or) older engines. Of course, differences in technological levels among individual manufacturers may also appear in efficiency, but the technological gap is less and less present in today's globalizing world. According to the company data, RTM 322–04/08, RTM 322–01/9 and RTM 322–01/9A nowadays represent the best specific fuel consumption (0.258 kg/kWh), which results in slightly more than 30% thermal efficiency.
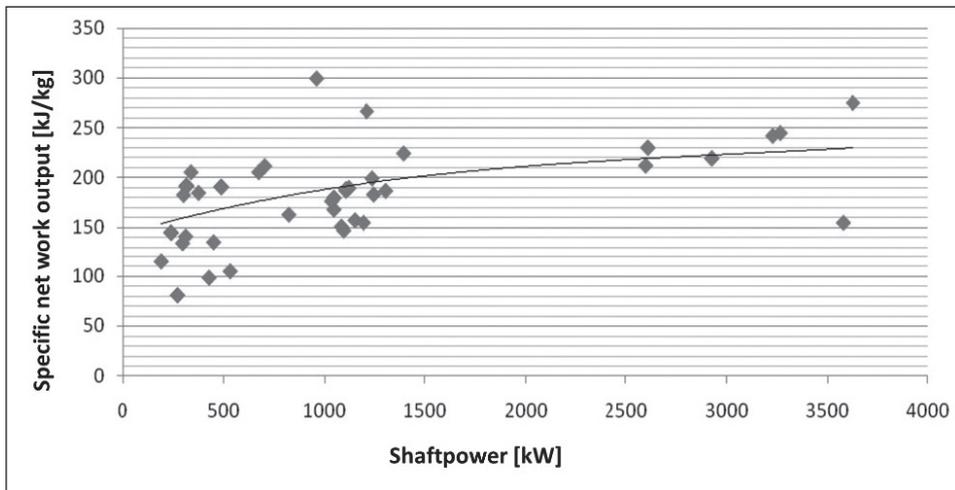
Figure 12. *Specific net work output vs. shaft power diagram.* [Edited by the author.]

The next important quality indicator of turboshafts is the specific net work output (Figure 12). This indicator has a close relationship with the geometric dimensions and mass of the engine. The specific net work output of the engine is higher if smaller mass flow rate is required to generate the same shaft power, reducing the size and consequently

the mass of the engine. The situation is the same as it was concerning thermal efficiency. Engines with higher shaft power (larger engines) produce better specific net work output. Considering the trend line, the difference is almost 100 kJ/kg, but there are engines from 100 kJ/kg to 300 kJ/kg specific net work output.
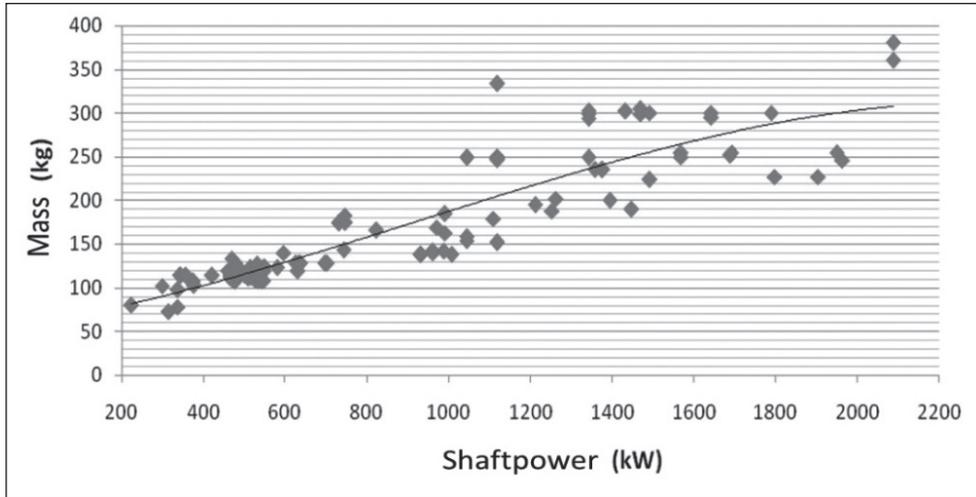
Figure 13. *Specific power vs. shaft power diagram.* [Edited by the author.]

In Figure 13 the engine mass versus shaft power is displayed which generally ranges from at about 80 kg to 300 kg. This information is not surprising because it is clear that higher shaft power needs larger and heavier engine. The next diagram in Figure 14 is more informative. This diagram represents the shaft power to mass ratio (specific power) of turboshaft engines, which also enables the comparison of one design to another. Like in previous cases the larger size provides better values. The average specific power ranges from 3 kW/kg to 7 kW/kg, but there are engines with 8kW/kg specific power, which is quite excellent.
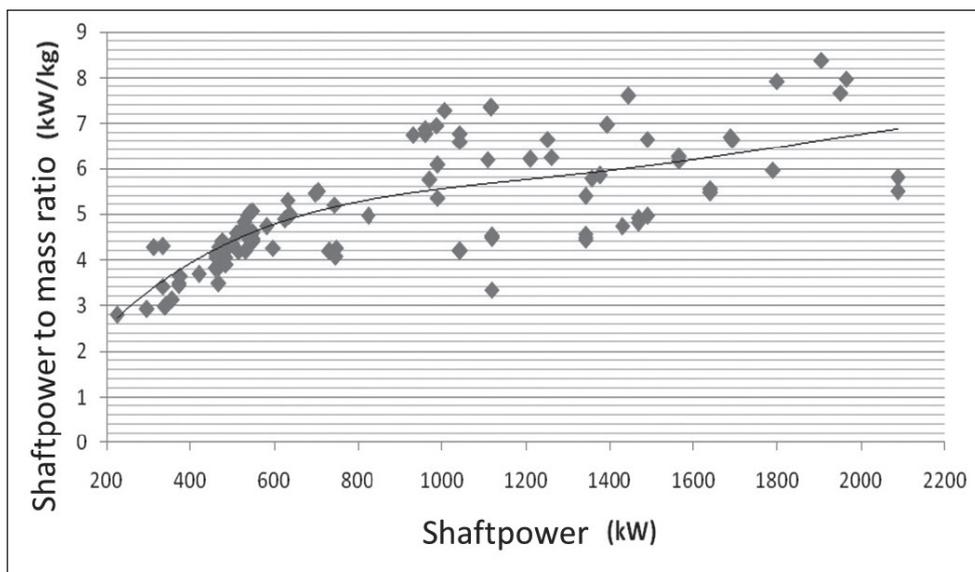
Figure 14. *Specific power vs. shaft power diagram.* [Edited by the author.]

The most important results of this computer aided processing of engine data are that it clearly displays the size dependence of these engine parameters. Even the largest engines in this category are small comparing them, for example, to turbofans. This fact predetermines the relatively week values of their specific parameters, like specific fuel consumption, specific net work output and specific power, which are in fact important quality indicators. Inside the category, this trend significantly appears in Figure 11, 12 and 14. In accordance with this, it is misconducting to compare turboshaft engines by these indicators to other gas turbine engine categories, what is more even inside the category if their shaft power is not quite close to each other.

We can ask the question: does size really matter? The answer for the question is obvious. The size is extremely important considering these indicators. We can firmly state that the helicopter turboshaft category is penalised by its own small size and inside the category this size dependence is even more clear.

Summarizing the essence of this statistics, usually we can find the following turboshaft engine data:

shaft power:	200–3700 kW
compressor pressure ratio:	7:1–16:1
mass flow rate:	2–15 kg/s
turbine inlet temperature:	1100–1500 K
specific fuel consumption:	0.25–0.5 kg/kWh
thermal efficiency:	17–32%
engine mass:	80–400 kg
specific power:	3–8 kW/kg

Conclusions

The leading military powers began to use helicopters in the early fifties. The experiences of local wars (Korea, Algeria, Vietnam, Middle East, etc.) offered newer and newer areas of their application and contributed to their specialization and the rapid growth of their number. Within a few years, due to the increasing take-off mass and payload, helicopters outgrew the available piston engines and the only alternative was a lightweight, high-performance power source that the turboshaft engines are perfectly suited for.

Of course, over the past 60 years, many improvements and innovations have changed dramatically the turboshaft category. The increased compressor pressure ratio, turbine inlet temperature, the FADEC[14] system highly improved their performance, while the long-term reliability and maintainability has also increased. Nonetheless, some indicators of helicopter turboshaft engines, like thermal efficiency and all specific parameters are significantly worse than the average of other gas turbine engine categories. Unfortunately, there is not much to do with this fact, because it is coded in their relatively small size and their structural arrangement.

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[14] FADEC—Full Authority Digital Engine Control

Annex 1/1. *Most important manufacturers, types, technical data.* [7] (N/A: no data)

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power(kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
General Electric	T58–GE–1	CH–3B/C, SH–3A, S–61A	962	N/A	N/A	N/A	142
General Electric	T58–GE–2	AB204AS	988	N/A	N/A	N/A	142
General Electric	T58–GE–3	TH–1F, UH–1F/P	962	N/A	N/A	N/A	140
General Electric	T58–GE–5	CH–3E, HH–3E/F, SH–3E/F	1118	N/A	0.365	22.8	152
General Electric	T58–GE–6	CH–46A	932	N/A	N/A	N/A	138
General Electric	T58–GE–8B	SH–2F, SH–3G, UH–2A/B/C, CH–113A	932	N/A	N/A	N/A	138
General Electric	T58–GE–8F	SH–2F, SH–3G, UH–2C, CH–124A/B	1007	N/A	0.365	22.8	138
General Electric	T58–GE–10	CH–46D/F, UH–46D/F, HH–2D, HH–3F, SH–3D/G/H, ASH–3A/D/TS, AS–61R	1044	N/A	0.377	22.1	158
General Electric	T58–GE–16	CH–46E	1394	N/A	0.322	25.9	200
General Electric	T58–GE–100	ASH–3H, CH–124A/B Sea King	1118	N/A	N/A	N/A	152
General Electric	T58–GE–402	CH–46D/E, SH–3H, UH–3H	1118	N/A	N/A	N/A	152
General Electric	T64–GE–1	CH–53A	2297	N/A	N/A	N/A	N/A
General Electric	T64–GE–3	HH–53B	2297	N/A	N/A	N/A	N/A
General Electric	T64–GE–6	CH–53A, TH–53A	2125	N/A	N/A	N/A	N/A
General Electric	T64–GE–7	CH–53C, HH–53B/C/H	2926	N/A	N/A	N/A	N/A

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power(kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Honeywell Defense and Space	HTS900	Bell ARH (1)	744	664	0.320	26.0	143
Honeywell Engines & Systems	AL5512	BV234 & BV–234LR (2)	3039	2218	0.330	25.2	354
Honeywell Engines & Systems	LTS101–600A–3A	Eurocopter AS350B (1) Eurocopter AS350D (1) Eurocopter AS350A (1)	485	466	0.347	24.0	120
Honeywell Engines & Systems	LTS101–650B–1	Eurocopter BK–117A (2)	470	418	0.347	24.0	122
Honeywell Engines & Systems	LTS101–750C–1	Bell 222B, UT (2)	510	487	0.353	23.6	111
Honeywell Engines & Systems	LTS101–750B–2	Eurocopter/U.S. Coast Guard HH–65A (2)	515	491	0.347	24.0	123
Honeywell Engines & Systems	LTS101–750B–1	Eurocopter BK–117B (2)	468	440	0.353	23.6	134
Honeywell Engines & Systems	LTS101–850B–2	Eurocopter HH–65A (2)	582	556	0.347	24.0	123
Honeywell Engines & Systems	LTS101–700D–2	Eurocopter AS350B2	546	485	0.347	24.0	120
Honeywell Engines & Systems	LTS101–650C–3	Bell 222 (2)	470	446	0.347	24.0	110
Honeywell Engines & Systems	LTS101–600A–2/–3	Eurocopter AS350D (1)	459	440	0.347	24.0	120
Honeywell Engines & Systems	T55–L–712	CH–47D (2)	2796	2237	0.322	25.9	354

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power(kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Honeywell Engines & Systems	T55–L–712F	HCMK2/2A (2)	3218	2349	0.319	26.1	354
Honeywell Engines & Systems	T55–L–712 S/SB	CH–47D (2)	3262	2349	0.315	26.4	354
Honeywell Engines & Systems	T55–L–712E	CH–47 (2)	2796	2237	0.322	25.9	354
Honeywell Engines & Systems	T55–L–712 S/SC	CH–47D (2)	2796	2237	0.322	25.9	354
Honeywell Engines & Systems	T55–L–714A	CH–47S/D & HCMK3 (2)	3629	3108	0.316	26.4	399
Honeywell Engines & Systems	T55–L–714	MH–47E (2)	3562	3069	0.312	26.7	399
Honeywell Engines & Systems	T55–GA–714A	CH–47D/F (2)	3562	3069	0.312	26.7	399
Honeywell Engines & Systems	T5313B	Bell 205A1, Bell 205B	1044	932	0.365	22.8	249

Annex 1/2. *Most important manufacturers, types, technical data.* [7]

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Honeywell Engines & Systems	T5317B	Bell 205A1, Fuji Bell 205B	1119	1007	0.367	22.6	250
Honeywell Engines & Systems	T5317BCV	B210, Huey II, Bell 205	1342	1119	0.346	24.0	249
Honeywell Engines & Systems	T53–L–13B	Bell UH–1, Agusta AB205	1044	932	0.365	22.8	249
Honeywell Engines & Systems	T53–L–703	Bell AH–1, Bell UH II	1119	1007	0.395	21.0	247
LHTEC	CTS800–4N	AgustaWestland Super lynx (2) AgustaWestland/ Turkey T129 (2)	991	920	0.28	29.7	185
LHTEC	CTS800–4K	Shimaywa US2 (1)	991	920	0.28	29.7	163
MTR	MTR 390–2C	Eurocopter Tiger (2)	972	885	0.276	30.1	169
MTRI	MTR 390–E	Eurocopter Tiger (2)	1110	1009	0.288	28.9	179
Pratt & Whitney Canada	PT6B–36A	Sikorsky S–76B (2)	732	661	0.353	23.5	174
Pratt & Whitney Canada	PT6B–36B	Sikorsky S–76B (2)	732	661	0.353	23.5	175
Pratt & Whitney Canada	PT6B–37A	Agusta A119 Koala (1)	747	650	0.361	23.0	175
Pratt & Whitney Canada	PT6C–67A	Bell Agusta BA609 (2)	1447	1249	N/A	N/A	190
Pratt & Whitney Canada	PT6C–67C	Agusta AW139 (2)	1252	1142	0.308	27.0	188
Pratt & Whitney Canada	PT6C–67D	(UH–1H) DynCorp Global Eagle (1)	1262	1182	0.308	27.0	202

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Pratt & Whitney Canada	PT6C–67E	EC175	1324	N/A	N/A	N/A	N/A
Pratt & Whitney Canada	PT6T–3 TwinPac ®	Bell UH–1N, Bell CUH–1N, Bell VH–1N, Bell AH–1J, Bell AH–1T, Bell/ Agusta-Bell 212, Sikorsky S–58T	1342	1193	0.362	23.0	294
Pratt & Whitney Canada	PT6T–3B/BF TwinPac ®	Bell/Agusta-Bell 212 Bell/Agusta-Bell 412 Bell/ Agusta-Bell 412SP (1)	1342	1193	0.365	0.228	299
Pratt & Whitney Canada	PT6T–3BE/BG TwinPac ®	Bell 412 HP, Agusta-Bell 412 Agusta-Bell 412 HP (1)	1342	1193	0.365	22.8	302
Pratt & Whitney Canada	PT6T–3D/DE/ DF TwinPac ®	Bell/Agusta-Bell 412 EP (1)	1432	1268	0.365	22.8	302
Pratt & Whitney Canada	PT6T–6 TwinPac ®	Agusta-Bell 212/412 Sikorsky S–58T (1)	1469	1301	0.36	23.1	299
Pratt & Whitney Canada	PT6T–6B TwinPac ®	Agusta-Bell 412 HP (1)*	1469	1301	0.36	23.1	305
Pratt & Whitney Canada	PW206A	MD Explorer	477	423	N/A	N/A	108
Pratt & Whitney Canada	PW206B	EC135P1	463	419	N/A	N/A	112
Pratt & Whitney Canada	PW206B2	EC135P2	518	457	N/A	N/A	112
Pratt & Whitney Canada	PW206C	Agusta A109Power (2)	477	423	N/A	N/A	108
Pratt & Whitney Canada	PW206E	MD Explorer	477	423	N/A	N/A	108
Pratt & Whitney Canada	PW207C	Agusta A109 Grand (2)	548	466	N/A	N/A	108

Annex 1/3. *Most important manufacturers, types, technical data.* [7]

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Pratt & Whitney Canada	PW207D	Bell M427 (2)	529	466	N/A	N/A	110
Pratt & Whitney Canada	PW207D1	Bell 429 (2)	536	474	N/A	N/A	108
Pratt & Whitney Canada	PW207E	MD Explorer (2)	529	466	N/A	N/A	109
Pratt & Whitney Canada	PW207K	Kazan Ansat (2)	544	466	N/A	N/A	108
Pratt & Whitney Canada	PW210S	Sikorsky S–76D (2)	802	802	N/A	N/A	N/A
Rolls-Royce	RR 300	Robinson R66 (1)	224	179	0.408	20.4	80
Rolls-Royce	RR 500TP	Under development	298	283	0.335	24.9	102
Rolls-Royce	Model 250–C20B	Agusta A109A (2).Bell 206B JetRanger (1). Bell 206L LongRanger (1).Eurocopter BO105 (2). Hiller FH1100 (1) MD Helicopters MD500D (1)	313	313	0.395	21.1	73
Rolls-Royce	Model 250–C20F	Eurocopter AS355F (2)	313	313	0.395	21.1	73
Rolls-Royce	Model 250–C20J	Bell 206B JetRanger III (1) Bell TH–57 (1) Bell TH–67 (1)	313	313	0.395	21.1	73

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Rolls-Royce	Model 250–C20R	Agusta A109C (2)Bell 206B JetRanger III (1) HeliLynx 355FX (2) Starflex 355F2 (2) Kamov Ka–226 (2) MD Helicopters MD500E (1) MD Helicopters MD520N (1) PZL SW–4 (1) Tridair Gemini ST (2)	336	336	0.370	22.5	78
Rolls-Royce	Model 250–C20W	Enstrom 480B (1) Northrop Grumman Fire-Scout (1) Schweizer 330SP/333 (1)	313	313	0.395	21.1	73
Rolls-Royce	Model 250–C28	Eurocopter BO 105LS (2)	373	373	0.359	23.2	107
Rolls-Royce	Model 250–C28B	Bell 206L–1 LongRanger II (1)	373	373	0.359	23.2	108
Rolls-Royce	Model 250–C30	MD Helicopters MD530F (1)	485	415	0.360	23.1	114
Rolls-Royce	Model 250–C30G	Bell 230 (2)	485	415	0.360	23.1	115
Rolls-Royce	Model 250–C30M	Soloy AS350 AllStar(1)	485	415	0.360	23.1	114
Rolls-Royce	Model 250–C30P	Bell 206L–3 LongRanger III (1)Bell 206L–4 LongRanger IV (1)	485	415	0.360	23.1	114

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Rolls-Royce	Model 250–C30R/3	Bell OH–58D (1) Boeing Little Bird ULB (1) MD Helicopters AH/MH–6 (1)	485	415	0.360	23.1	124
Rolls-Royce	Model 250–C30S	Sikorsky S–76A (2)	485	415	0.360	23.1	114
Rolls-Royce	Model 250–C40	Bell 430 (2)	533	457	0.349	23.9	127
Rolls-Royce	Model 250–C47B/M	Bell 407 (1) MD Helicopter MD 600N (1)	485	447	0.355	23.4	124
Rolls-Royce	Gem 42–1	Agusta Westland Lynx (2)Agusta Westland A129 Mangusta (2)	746	664	0.310	26.8	183
Rolls-Royce	Model 250–B17F	Groen Brothers Aviation Hawk 4 (1) O&N Silver Eagle (1) Soloy Cessna 206 'Mark II' (1)	336	336	0.373	22.3	98

Annex 1/4. *Most important manufacturers, types, technical data.* [7]

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Rolls-Royce Turbomeca	RTM 322–01/8	AgustaWestland Merlin HC HM Mk1	1567	1374	0.276	30.2	254
Rolls-Royce Turbomeca	RTM 322–01/12	AgustaWestland Apache AH Mk1 (WAH64)	1567	1374	0.276	30.2	250

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Rolls-Royce Turbomeca	RTM 322–02/8	AgustaWestland Merlin HC Mk3	1688	1406	0.276	30.2	252
Rolls-Royce Turbomeca	RTM 322 Mk250	AgustaWestland Merlin HC Mk3	1693	1491	0.276	30.2	255
Rolls-Royce Turbomeca	RTM 322–04/08	AgustaWestland EH101	1950	1555	0.258	32.3	254
Rolls-Royce Turbomeca	RTM 322–01/9	NHI NH90 (2)	1799	1664	0.258	32.3	227
Rolls-Royce Turbomeca	RTM 322–01/9A	NHI NH90 (2)	1905	1805	0.258	32.3	227
Rolls-Royce	AE 1007	Bell–Boeing V22 Osprey (2)	4549	3253	0.259	32.1	440
Turbomeca	Arrius 1A	Eurocopter AS 355 N (2)	340	296	0.338	24.7	114
Turbomeca	Arrius 1A1	Eurocopter AS 355 NP (2)	343	305	0.338	24.7	114
Turbomeca	Arrius 1M	Eurocopter AS 555 N (2)	357	303	0.338	24.7	114
Turbomeca	Arrius 2F	Eurocopter EC120 (1)	376	336	0.338	24.7	103
Turbomeca	Arrius 2B1	Eurocopter EC135 t1 (2)	421	348	0.320	26.0	114
Turbomeca	Arrius 2B1A–1	Eurocopter EC135 t1 (2)	463	414	0.320	260.	114
Turbomeca	Arrius 2B2	Eurocopter EC135 t2i (2)	485	438	0.328	25.4	114
Turbomeca	Arrius 2K1	Agusta A109 Power (2)	500	425	0.320	26.0	115
Turbomeca	Arrius 2K2	Agusta A109 LUH (2)	534	454	0.321	26.0	115
Turbomeca	Arrius 2G1	Ka 226t (2)	537	427	N/A	N/A	115
Turbomeca	Arriel 1B	Eurocopter AS 350 BA (1)	478	441	0.362	23.0	114
Turbomeca	Arriel 1D	Eurocopter AS 350 B1 (1)	510	450	N/A	N/A	N/A
Turbomeca	Arriel 1D1	Eurocopter AS 350 B2 (1)	546	466	0.352	23.6	122

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Turbomeca	Arriel 1C2	Eurocopter AS 365 2 (2)	550	471	0.349	23.9	119
Turbomeca	Arriel 1M1	Eurocopter AS 565 Panther (2)	558	487	N/A	N/A	N/A
Turbomeca	Arriel 1E2	Eurocopter EC 145	550	516	0.349	23.9	125
Turbomeca	Arriel 1K2	Agusta A 109 K	550	471	0.349	23.9	123
Turbomeca	Arriel 1S1	Sikorsky S76 A++	539	466	0.345	24.1	121
Turbomeca	Arriel 2B1	Eurocopter AS350 B3(1)/EC 130B4	632	544	0.333	25.0	119
Turbomeca	Arriel 2C	Eurocopter AS 365 N3	635	597	0.333	25.0	128
Turbomeca	Arriel 2C2CG	Eurocopter HH65C (2)	697	474	N/A	N/A	128

Annex 1/5. *Most important manufacturers, types, technical data.* [7]

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Turbomeca	Arriel 2C1	Eurocopter EC155 B	626	596	0.334	24.9	128
Turbomeca	Arriel 2S1	Sikorsky S76 C+	638	587	0.329	25.4	128
Turbomeca	Arriel 2S2	Sikorsky S76 C++	688	621	N/A	N/A	N/A
Turbomeca	TM 333 2M2	Cheetan (1)/Cheetal (1)	824	735	N/A	N/A	N/A
Turbomeca	TM 333 2B2	DHRUV (2)	824	735	0.315	26.5	166
Turbomeca	Ardiden 1H1	DHRUV (2)	1024	858	0.280	29.8	N/A
Turbomeca	Makila 1A	Eurocopter AS 332	1240	1130	N/A	N/A	N/A

Manufac-turer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Turbomeca	Makila 1A1	Eurocopter AS 332L1/AS 532	1357	884	0.294	28.3	235
Turbomeca	Makila 1A2	Eurocopter AS 332MK2 (2)/ AS532MK2	1376	1236	0.290	28.8	235
Turbomeca	Makila 2A	Eurocopter EC 725/ EC 225 (2)	1564	1411	0.285	29.2	N/A
Turbomeca	Makila 2A1	Eurocopter EC 725/ EC 225 (2)	1567	1418	N/A	N/A	N/A
Turbomeca	Makila 1K2	Denel Roivalk (2)	1376	1236	0.290	28.8	235
Klimov	GTD 350	Mi–2	298	N/A	0.489	17.0	135
Klimov	TV2–117	Mi–8	1119	N/A	0.369	22.6	334
Klimov	TV3–117	Mi–24A	1659	N/A	N/A	N/A	N/A
Klimov	TV3–117M	Mi–14	1659	N/A	N/A	N/A	N/A
Klimov	TV3–117MT	Mi–8MT/Mi–17	1659	N/A	N/A	N/A	N/A
Klimov	TV3–117KM	Ka–27	1659	N/A	N/A	N/A	N/A
Klimov	TV3–117V	Mi–24	1566	N/A	N/A	N/A	N/A
Klimov	TV3–117VK	Ka–27. Ka–29. Ka–32	1641	N/A	N/A	N/A	N/A
Klimov	TV3–117VM	Mi–8MT/Mi–17	1491	N/A	N/A	N/A	N/A
Klimov	TV3–117VMA	Ka–27. Ka–29. Ka–31. Mi–24. Mi–28A/N. Ka–32	1641	N/A	0.288	28.9	295
Klimov	VK–2500 I	8MT/Mi–17. Mi–24. Mi–14. Ka–32. Ka–50. Mi–28	1491	N/A	0.295	28.2	300
Klimov	VK–2500 II	8MT/Mi–17. Mi–24. Mi–14. Ka–32. Ka–50. Mi–28	1641	N/A	0.287	29.0	300
Klimov	VK–2500 II	8MT/Mi–17. Mi–24. Mi–14. Ka–32. Ka–50. Mi–28	1790	N/A	0.282	29.6	300
Klimov	TV7–117V/VM	Mi–38	2088	N/A	0.295	28.2	360
Klimov	TV7–117VK	Mi–28. Ka–50. Ka–52	2088	N/A	0.308	27.0	380
Klimov	VK–800V	Ansat. Mi–54. Ka–126. Ka–226	597	447	0.390	21.3	140

Manufacturer	Type of the engine	Helicopter, in which the engine is built in	Take off power (kW)	Max continuous (kW)	Specific fuel consumption (kg/kWh)	Thermal efficiency (%)	Mass (kg)
Ivchenko-Progress	D–136	Mi–26. Mi–26T	8501	N/A	0.266	31.4	1077

Comparison of Fastening Methods of Military Vehicles on Railway Freight Wagons Using Fastening Straps

Martin VLKOVSKÝ[1]

The paper identifies possible ways of fastening military vehicles on rail freight wagons using textile fastening straps and then compares particular methods. The comparison includes, besides used methods—diagonal lashing and V-shape diagonal lashing, the previously used method of lashing—slope lashing, which is currently not allowed to use. To calculate the inertia forces affecting the cargo, respectively the fastening straps, appropriate methods in accordance with EN 12195–1 have been chosen. In the discussion part, recommendations in relation to the fastening of military vehicles on rail freight wagons are introduced.
Keywords: *fastening, fastening straps, inertia forces, railway freight wagons*

Introduction

Railway transport represents an important mode of transport for the Army of the Czech Republic. On the one hand railway transport is not so suitable for transportation of small amount (number) of military vehicles and material for a short distance, on the other hand it is quite effective for transportation of large amount (number) of military vehicles for medium and long distance. The paper is focused on railway transport of ground military vehicles with emphasis on transport selected tracked vehicles. When transporting, in any mode of transport, inertia forces act on the carried cargo. Although the exact size of forces is unknown before the start of transport, it can be assumed from the empirically determined acceleration coefficients that are part of the relevant standards (e.g. EN 12195–1). [1] In case of military transfers and transports, the ground military vehicles must be fastened taking into consideration the assumed size of the inertia forces. It is necessary to choose the method of fastening taking into account the type and weight of the ground military vehicles and the type of railway freight wagon. If the cargo—ground military vehicle is incorrectly or inadequately fastened, during the railway transport it may shift, fall, etc. which can cause damage to the fastening material, cargo (ground military vehicles) or railway freight wagon. In extreme cases, after the railway transport itself, the incorrect unloading may result in injuries to the unloading group.

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Basic Principles of the Fastening of Ground Military Vehicles to the Railway Freight Wagons

Freight fastening, ground military vehicles in this case, is being proceeded in accordance with the provision Allied Movement Publication STANAG 2468 CSS (Edition 2): Technical Aspects of the Transport of Military Materials by Railroad AMOVP–4(A), [2] eventually Loading guidelines UIC – International Railway Union, [3] Volume 2 – Goods, eventually with Guideline of CDC for provisioning of military rail transport to the code D33. [4]

According to the previously mentioned regulation, it is possible to use the following material for fastening ground military vehicles: [2] [3] [4]
- wedges with steel thorns;
- wooden wedges;
- underlay wedges;
- locking wood;
- binding wires;
- wheel stops;
- fastening straps.

This article will focus on one of the most frequently used fasteners according to the conditions of The Army of the Czech Republic—a fastening strap. A critical value for fastening straps is the Lashing Capacity (LC), which sets the maximal load – pulling force, which is guaranteed by the producer and to which the fastening strap is dimensioned.

The value of the Lashing Capacity cannot be confused with the Breaking Force (BF), which shows the power during a rupture, for which the fastening strap is designed (EN 12195–2). [5] The producers ensure, for safety reasons, sufficient difference between LC and BF, that in case of improper use of the fastening strap, meaning its overloading, will not end up in immediate rupture. During the use of a fastening strap for heavier freight or generally during the effect of stronger than assumed inertial forces, the lifetime of the individual strap components is reduced. Responsibility for any damage is an important aspect, that is why the producer guarantees possible *tension* only until the moment, when:

$$Fx,y,z \leq LC \quad (1)$$

- where *Fx,y,z* represents a general list of inertia forces acting in axes (x, y and z).

In accordance with source [2] and [3], ground military vehicles fasten differently on the front, respectively on the rear of the vehicle. From the front of the ground military vehicle, the straps are guided diagonally in the shape of the letter *V*, from the rear of the ground military vehicle, they are lead diagonally by crossing. (Figure 1) [6]
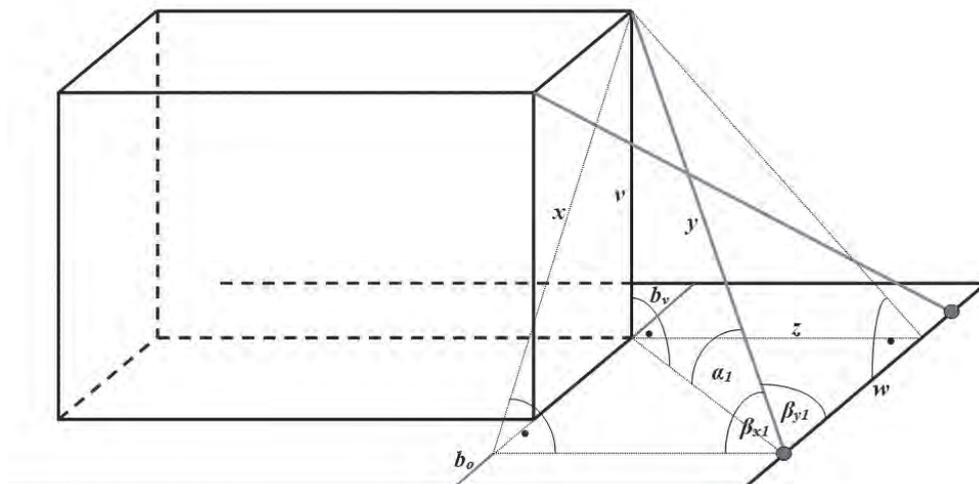
Figure 1. *Fastening model – diagonally by crossing of the ground military vehicle on a railway freight wagon.* [Edited by the author.]

The anchor points on the ground military vehicles and their distance from the anchor points (steel holes) of the freight wagon are decisive for fixation in this way. The provision [5] specifies the angle, which should be used to fasten the fastening strap with the imaginary surface of the ground military vehicle, to be 30°. (Figure 2.) In real conditions, it is possible to choose any anchor point on the railway freight wagon, which has its angle as close as possible to the required 30°.
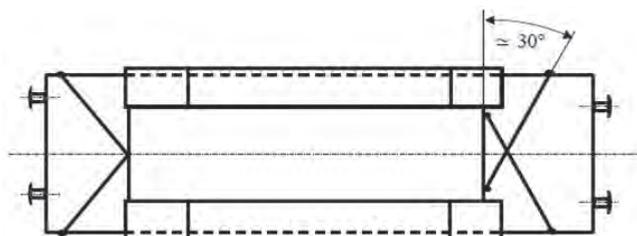
Figure 2. *Fastening of ground military vehicles on a railway freight wagon using fastening straps.* [2]

Fastening Model of Infantry Combat Vehicle

The key factor in the fastening of required ground military vehicle is the correct choice of a railway freight wagon, which matches that military vehicle in its length, load capacity and positions of the anchor points. Especially the above mentioned angle (Figure 2) provides sufficient ability to fasten a military vehicle. This requirement is especially much more significant to military vehicles with a higher weight, such as tracked vehicles, for which

it is assumed to have higher values of inertial forces (Fx, y, z). Available freight wagon length and ability to load the ground military vehicle on a railway freight wagon is analysed in the paper. [6] For the purposes of this paper, there will be discussed the parameters used in the following formula, which is based on EN 12195-1 standard: [1]

$$F = m \cdot g \cdot \frac{(c_{x,y} - \mu \cdot f_\mu \cdot c_z)}{2 \cdot (\cos \alpha \cdot \cos \beta_{x,y} + \mu \cdot f_\mu \cdot \sin \alpha)} \ [N] \tag{2}$$

- where F is the searched inertial force (inertial forces), which can be expected during the transportation by parameters of the ground military vehicle, railway freight wagon, railway track and other conditions (e.g. weather conditions), m means the weight of the cargo—ground military vehicles, g means gravitation acceleration, $c_{x, y, z}$ means the acceleration coefficient in the appropriate axes, µ means dynamic coefficient of friction, f_μ recalculating coefficient of friction, α, $\beta_{x,y}$ represents the angles, which are held by the used fastening straps with appropriate surfaces. (Figure 1)

Model assumptions:
- the cargo is made of military fighting vehicle BVP–2, which is in service of the Army of the Czech Republic; (Table 1)
- four-axle railway freight wagon series Smmps 54 in technical interval 4728 (Table 2) is used for transport of BVP–2;
- BVP–2 is, on the railway freight wagon, centred both longitudinally and transversely in the axle of the railway freight wagon;
- for fastening there are used anchor points in the front and the rear part of the vehicle (on Figure 1 they are demonstrated by the top edges of the model block);
- for fastening normally used fastening straps with LC = 5,000 daN or 10,000 daN are used.

To determine the searched inertial forces, respectively the restraining force of the lashing straps, the values from Table 3 and B.1 in source [1] should be used; to determine the size of relevant angles (α, β) the corresponding trigonometric functions and the Pythagoras theorem are to be used.

Basic input data are derived from the Tactical–Technical Data of the transported cargo (BVP–2) and the used railway freight wagon (Smmps 54 at the Technical Interval 4728). The selected data is summarized in Tables 1 and 2.

Table 1. *Basic technical parameters of BVP–2 are used in the calculation.* [7] [8]

Parameter	Value	Unit	Note
Weight (m)	14,300	kg	
Width	2,700	mm	
Height (v)	1,600	mm	Lashing point at the same height.
Length	6,720	mm	

Parameter	Value	Unit	Note
Distance 1 (bv)	350	mm	The distance of the fastening points on the vehicle from the side edge of the railway freight wagon.
Distance 2 (z)	3,000	mm	The distance of the fastening points on the vehicle from the surface where the anchor points are located on the railway freight wagon.

Table 2. *Basic technical parameters of the Smmps 54 railway wagon in the technical interval 4728 are used in the calculation.* [8]

Parameter	Value	Unit	Note
Loading length	14,000	mm	
Loading width	3,100	mm	
Wagon width (w)	3,100	mm	
Distance 3 (bo)	200	mm	The distance of the fastening points from the side edge of the railway freight wagon.

The acceleration coefficients and friction factors from Table 3 are also used for the calculation. The values of the acceleration coefficients apply to railway transport. Interestingly, the values of the acceleration coefficients presented in *The Regulation concerning the International Carriage of Dangerous Goods by Rail (RID),* which is the connection C to *The Convention concerning International Carriage by Rail,* are higher.

For the friction factor, two values are used (Table 3) which demonstrate the difference between track and wheel vehicles. However, the calculation abstracts from the larger contact area in case of tracked vehicles. This could reduce the difference between calculated inertia forces for track and wheeled vehicles. The value of friction factor 0.6 is used only to model the illustration difference in access to different types of vehicles (track versus wheel).

If necessary, special cover can be used on straps or special anti-skid surfaces on the transport vehicle. However, the use of anti-skid surfaces is not applied very frequently in railway transport (in particular railway freight wagons). Frequent use of anti-skid surface is used in road transport. In combined transport there is the possibility of using removable transport platforms or storage containers, where the type of floor is variable and the customer requirements (in this case the army) are met.

Table 3. *Values for calculating inertia forces.* [1]

Parameter	Value	Unit
Gravitational acceleration (g)	9.81	$m \times s^{-2}$
Coefficient of longitudinal acceleration (cx)	1.0	–
Transverse acceleration coefficient (cy)	0.5	–
Coefficient of vertical acceleration (cz)	1.0	–
Conversion factor for friction (fμ)	0.75	–
Friction factor – tracked vehicles (μt)	0.3	–
Friction factor – wheeled vehicles (μw)	0.6	–

Finally, Table 4 summarizes the sizes of angles, which are required to calculate the inertia forces. For the first set of angles *(α1, βx1, βy1)* Figure 1 can be used, other schemes for further types of fastening (slope lashing and V-shape diagonal lashing) would be analogous. Angle calculations are based on Tables 1 and 2.

Table 4. *Angle sizes and their specifications.* [Edited by the author.]

Sign	Specification	Angle size	Unit
α_1	Angle for crossed diagonal lashing	22.12	°
α_2	Angle for slope lashing	28.04	°
α_3	Angle for V-shape diagonal lashing	25.94	°
β_{x1}	Longitudinal direction – angle for crossed diagonal lashing	45.10	°
β_{x2}	Longitudinal direction – angle for slope lashing	28.18	°
β_{x3}	Longitudinal direction – angle for V-shape diagonal lashing	34.91	°
β_{y1}	Transverse direction – angle for crossed diagonal lashing	53.13	°
β_{y2}	Transverse direction – angle for slope lashing	87.47	°
β_{y3}	Transverse direction – angle for V-shape diagonal lashing	68.34	°

The size of the individual angles fundamentally affects the resulting inertia force that acts on the strap and is determined by the type of fastening. The corresponding type of fastening corresponds to the formula (2) resulting from EN 12195–1. Different influence of the angles on the final calculation is demonstrated, for example, by a contribution in the proceedings. [9]

Using the input data from Tables 3 and 4, the required sizes of inertia forces are calculated, which must correspond to the permissible load-carrying capacity—traction force (LC) of the used fastening straps. The inertia forces are calculated for the x and y axes, for each of the three fastening methods and for two different sizes of friction factor (for μt = 0.3 and model value for μw = 0.6). The values of inertial forces are summarized in Table 5, showing the size of the inertial forces, i.e. regardless of their direction (sign).

It can be seen from Table 5, that there are large differences between sizes of inertia forces in individual axes using different fastening methods. Red highlighted is the prohibited method of fastening—slope lashing, which is the cause of the prohibition of using the inappropriateness of *protecting* the cargo against the undesirable effects of transverse inertial forces. In Table 5 it is the force F2y = 13.327 daN, which significantly exceeds the value of the commonly used fastening strap with LC = 10,000 daN. In general, it is clear that the lashing slope is a very appropriate way of fixing against the effects of longitudinal inertial forces (F2x), but very unsuitable against y-axis forces (F2y). From the values of the other inertia forces that are calculated for the remaining two fastening methods, respective two axes (x and y), it is obvious that inertia forces are between 3,011–7,359 daN. For fastening BVP–2 to the relevant railway freight wagon, it is necessary to use fastening straps with LC = 10,000 daN. The straps with LC = 5,000 daN would not have sufficient x-axis lashing capacity for both methods of fastening (cross-diagonal lashing and V-shape diagonal lashing). The sizes of the inertia forces found at the same time demonstrate the advantage of using the combination of the two fastening

methods, because one is more suitable for fastening ground military vehicles in the longitudinal direction and the second in the transverse direction.

Table 5. *Sizes of the searched inertia forces.* [Edited by the author.]

Sign	Specification	Value for μt	Value for μw	Unit
F_{1x}	Crossed diagonal lashing (x axis)	7,359	4,685	daN
F_{2x}	Slope lashing (x axis)	6,151	3,899	daN
F_{3x}	V-shape diagonal lashing (x axis)	6,503	4,129	daN
F_{1y}	Crossed diagonal lashing (y axis)	3,011	484	daN
F_{2y}	Slope lashing (y axis)	13,327	1,400	daN
F_{3y}	V-shape diagonal lashing (y axis)	4,482	663	daN

The theoretical model, which evaluates the hypothetical possibility, where BVP–2 is a wheeled vehicle with the same values but with a friction factor of (μw), is mentioned in the next column in Table 5. Due to its doubled friction factor value (μw=2 μt) the inertial forces are significantly smaller in both axes than in the real *tracked version* of BVP–2. In the y axis, the inertial forces (F1y, F3y) are insignificant, in the y axis they do not outreach 5,000 daN (F1x, F3x) and for that purpose it would be possible to fasten the model vehicle with no problems only with fastening straps with lashing capacity LC = 5,000 daN.

Conclusion

The submitted contribution demonstrates important knowledge of the basic parameters of the transportation right before the commencing of the transport. The basic inputs were mentioned in the formula (2), where the values are given by the cargo (its weight), norm (EN12195–1), contact surfaces between the transported vehicle and the railway freight wagon and the angles, which are held by the fastening straps with appropriate surfaces. Certain deficiencies are the normative values of the acceleration coefficients, which can be different (higher) values during the real transportation (see e.g. [10] [11] [12]).

The calculation of the transportation model points to the importance of using allowed ways of fastening and to the right choice of anchor points on the railway freight wagon. The right implementation of the mentioned activities ensures effectiveness and safe course of the railway transportation.

Subject of the following research will be verification and statistical evaluation of real-valued acceleration coefficients. Subject of the analysis will not be only transportation, but mainly the train composition, where it is possible to assume significant size of the inertial forces in the x axis. Important factor will be the consideration of the choice of the right railway freight wagon, which will allow not only the load of the ground military vehicle, but also its proper fastening. In this respect can be the compliance of the required angle of 30° considered as one of the key factors, as Figure 2 implies.

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Correlation Between the Relation to Work and Social Intelligence Among the Mayors in the Slovak Republic

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The aim was to identify the relationship between the relation to work and social intelligence according to its individual factors. The subject of the research was the mayors of municipalities in Slovakia. The survey was attended by 787 mayors from a total of 2,753 (28.5%). To obtain the empirical data, a standardized social intelligence questionnaire based on MESI's psychometric approach was used, and the questionnaire finds a relationship with Job Satisfaction Instrument (JSI). The results of the research were processed using the SPSS 21 statistical software. To test the nature of relationships and dependencies between variables and to test the tightness of the relationship between the studied variables, a correlation analysis was used using the Pearson correlation coefficient, which expresses the degree of tightness of the linear relationship between the two (interval) variables. Research has found that the higher the rate of social irritability the mayor has, the more positive is his relationship to the job.

Keywords: *relationship to work, performance, social intelligence*

Introduction

Most author definitions define social intelligence positively, such as the ability to act wisely in interpersonal relationships, the ability of a positive social interaction for both sides. Relation to work in terms of activity is the conscious attitude of a person, which is created by family upbringing, cultural and social values and the support of the organization. Relation to work as an attitude is reflected in its positive or negative direction. According to scientific knowledge and the results of previous research, the ability to cope with the social environment needs a high degree of social intelligence which is one of the factors of job satisfaction and positive relation to work.

Social Intelligence

The set-up of social intelligence was first defined by Thorndike as "the ability to understand and manage other people and to act wisely in interpersonal relations." [58: 229] The author, in his definition, has lent himself to the two-factor structure of the definition of social intelligence and within this structure he distinguishes cognitive elements (people of social intelligence) and behavioural elements (wise behaviour in interpersonal relationships).

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This is also understood as an ability to understand other people and social interactions and to apply this knowledge in leadership and influencing other people for mutual satisfaction. [39]

According to others (for example) [41] [28], social intelligence is defined as the ability to purposefully address various social problems, with social intelligence as a specific phenomenon, relatively independent of general intelligence, consisting of two components:

- perceptive—the ability to understand other people, the ability to know the other person and to choose the appropriate behaviour towards him/her, respecting the particularities noted;
- action, behavioural—the ability to act wisely in interpersonal relationships, a way of social behaviour that fulfils a particular intention of an individual.

Social intelligence also has its negative charge in the form of manipulative behaviour. The authors point out that social intelligence consists of perceptions about the inner states and moods of others, the general ability to deal with other people, knowledge of social standards and social life, the ability to orient themselves in social situations, the use of social techniques to manipulate, the ability to interact with other people, social attractiveness and social adaptation. [54] Social intelligence is an intelligence focused on the social world. [27]

Social intelligence has a very close relation to emotional intelligence because it describes two aspects of the same construct. The most existing definitions of social and emotional intelligence include one or more of the following abilities: to understand and constructively express emotions, [38] to understand the experience of other people and to create cooperative interpersonal relationships, to effectively manage and regulate emotion, to realistically manage new situations and to solve problems of personal or interpersonal nature, be optimistic, positive and internally motivated, as well as formulate and achieve goals. [5]

Emotional intelligence is part of social intelligence. [5] It is defined as the ability of man to control his emotions and the emotions of others, the ability to distinguish between emotions and to use social information to regulate thought and action. The authors described components of emotional intelligence such as:

- the perception of emotions;
- using emotions;
- understanding emotions;
- managing emotions.

Emotional intelligence is known by defining its content in 5 basic dimensions, namely:

- *a)* ability to self-reflection (willingness and ability to think about oneself, to recognize oneself, strengths and weaknesses);
- *b)* self-control (ability to adequately express emotions);
- *c)* motivation (ability to excite others about an activity, engagement, creating a positive image of the world);
- *d)* empathy (the ability to understand others, to feel their feelings in the workplace which is also important for customer orientation, multicultural sensitivity, ability to lead subordinates and work in a team);
- *e)* social competency (ability to manage different forms of human interaction through communication, conflict resolution, respect of social norms and rules, achievement of socially preferred goals, etc.).

Rational intelligence, referred to as rational intelligence is considered to be a basic prerequisite for the success of a person in all activities performed; it also forms the basis for the general readiness of a person to understand the roles and situations. The basic premise of efficient use of rational intelligence is emotional intelligence. It is more important than general intelligence, because in order to achieve an intelligent management of the demands of contemporary life, general intelligence is not enough. [28]

It is necessary to recognise social intelligence as one of the important predictors of effective behaviour of managers. Knowledge of social intelligence makes it possible to predict the manager's success in social contacts. [40] In order for managers to be successful in their work, they must know about the nature of their work and their activities at least as much as they know about their professional duties. It is necessary to realize that the manager is the person on whom the success of the whole society depends. This means that when selecting people for managerial positions, attention should be paid to the ability of a future wise and correct negotiation in interpersonal relationships. [26]

The concepts of social intelligence and social competency are very close. The basic difference is the importance of the set-up of social intelligence, which is used in a positive, neutral and negative sense, and in addition to the cognitive component it also contains a behavioural component. A person with a high degree of social intelligence can behave sacrificially and empathically, but he can also use people to his advantage using manipulative techniques. The form of social intelligence (or a negative manipulative or empathic attitude) depends on the circumstances of the situation, but also on the characteristics and character of the individual. Social competency involves only a positive significance in order to achieve positive social relations, social behaviour. It is therefore possible to characterise a high level of social competency as the ability to use interpersonal (social) subcomponents in order to fulfil the expected (desirable) social behaviour. Social competency and social intelligence are understood as a multidimensional structure.

The concepts of social intelligence, emotional intelligence and social competency are interpreted very similarly by the authors. Until the present day, there is no uniformly accepted definition that would correspond to the real phenomenon of social intelligence and social competency. The differences, resp. similarities of the structure of social competency and social intelligence is not the subject of our discussion. Social competency represents certain predispositions of the individual—the ability to develop and train through education and gain experience. Social intelligence involves a component of social competency and a component of behaviour—it manifests itself in behaviour.

Social competency has been defined as social dexterity in terms of a certain skill to pursue its objectives in social interaction. [4]

Social competency was characterized by Cavell [21] as an effective social behaviour. Guralnik describes social competency as the ability to successfully and adequately choose and implement interpersonal goals. [29]

To achieve success in the social and working world, social competency is fundamental. Kollárik said in defining social competency that it is a skill that unconditionally should be available to an individual—an employee who interacts with clients in different situations, fulfilling his requirements and providing services. [35]

Social competency is defined as the ability to induce and maintain satisfying human relationships. [33] Social competency seems a "dexterity and efficiency in social interaction

with people, based on respect for human dignity." [55: 45] Defining dexterity the author includes the ability to establish contacts, cooperative behaviour and also to reduce tension. The core of effectiveness is the achievement of goals, the ability to identify the social problem, and then to infer tactics in it, the ability to solve the problem, the ability to get a partner to cooperate or compromise.

Social competency is the ability of a person to appropriately promote himself/herself in social relationships, as well as to his/her loved ones, as well as to the conditions of his/her inclusion in society. The socially oriented individual is able to understand the necessity, but also the benefits of accepting his/her surroundings. [7] He/she knows how to adapt to others by preserving his/her individuality. Social competency is perceived more narrowly defined as a set of communication skills. [49]

When defining social intelligence, it is necessary to distinguish how an individual understands, interprets his/her own behaviour, other people's behaviour, and the way to behave efficiently – socially intelligently and act accordingly. Social competency is the ability of an effective and consistent [18] behaviour in order to achieve the goals, i.e. socially responsible behaviour. By Hupková's opinion developing socially responsible behaviour means improving self-reflection, social process reflection, social competency training as defined. [30] "… social competency in itself contains an a priori positive connotation in contrast to socially intelligent behaviour, which may have a manipulative, antisocial character". [44: 308] Social competency is a component of emotional intelligence. [43]

For knowledge and intervention, it is useful to know the contents of these psychological structures, often used and studied in management.

Social intelligence is defined by scholars as an ability to understand people, [39] [54] to be able to cooperate well with them, to maintain viable relationships that are useful to all actors. Social intelligence is the irreplaceable ability of the mayor of the municipality.

According to scientific knowledge, the ability to cope with the social environment is one of the factors of job satisfaction and a positive relationship to work. [22] [53]

Individuals with a higher level of social intelligence have the ability to recognize and reduce stress, understand the causes of stress, recognize conflict situations in the workplace and manage to solve them. They have the ability to recognize and control their emotions, achieve a higher level of self-confidence and self-awareness, have a positive influence on others, enhance positive emotions among the members of the working group, and thus increase the positive attitude towards their work as well as members of the working group.

Individuals with a low level of social intelligence are less aware of their emotions, have less ability to cope with stressful and conflicting situations. This inability reduces their job satisfaction and positive relationship to work.

Relationship to Work

Relation to work in terms of activity is the conscious attitude of a person, which is created by family upbringing, cultural and social values, and the support of the organization. Relation to work in terms of profession is linked to a particular individual because it determines the characteristics of the personality (abilities, interests, temperament and character) and the *taste* to carry out this work affects the organization (e.g. by stimulation, communication,

interpersonal relationships, leadership and leadership of the manager, work environment and technology). Relation to work as an attitude is reflected in its positive or negative direction.

There are four main forms of work relation. Relationship to work is of such *making* that creates society (community). [51] Furthermore, it is the relationship between work and occupation that is being prepared (career choice) and which one chooses. Richard Finn also defines the relation to the current work, which characterizes the taste, or the reluctance to work and, above all, this type of relationship affects the organization. It also defines the relation to the work previously done, which is formed by memoirs. As a rule, it is positive, because one tends to forget about unpleasant experiences. [25]

Relation to work greatly determines the job satisfaction. It is considered to be one of the most important working attitudes and an indicator highlighting the level of human equilibrium with work and its conditions. [47]

Work satisfaction is "a collective attitude, the formation of which involves partial attitudes towards individual aspects, a sign of work." [34: 56] It is a complex phenomenon that involves and combines objective factors—working conditions, external factors of the environment on the widest scale—and subjective factors related to the values of individuals, their needs, the level of motivation. In essence, the relationship between the individual and the outside world is the result of a serious psychic phenomenon. Work satisfaction is the response of an individual to work experience. [8] Satisfaction as an attitude towards work is reflected in the overall life satisfaction of a person and adequate integration into society. [36]

If the impact of these attitudes is positive, we are talking about a positive relationship to work. If it is negative, we are talking about a negative relationship to work. [8]

The main manifestations of a positive relationship to work are moral responsibility for work (adequate, expected fulfilment of duties), positive emotional relation to work, which is manifested by satisfaction, good mood, pleasure and employment, discipline, guidelines, standards, an initiative that presents itself with working willingness, entrepreneurship and creativity, worker activity and good quality of work. On this basis, a positive relationship to work can be defined as a favourable or positive emotional state resulting from the assessment of work or work experience. On the other hand, the negative relationship to work is manifested in particular by the moral irresponsibility of the work done (indifference), the negative emotional relation to work (dissatisfaction, disappointment), lack of competency, lack of initiative (avoidance of work), low activity (passivity, laziness, reduction of the working time), poor quality of work (non-behaviour, error, inefficiency). [51]

The positive attitude towards work manifests itself in an overall working behaviour, activity and willingness to work, with an effort to initiate tasks, satisfaction with working conditions and a positive orientation towards work and performance. [48] The negative attitude towards work is reflected in reluctance, when we do not want to be successful, persistent dissatisfaction with working conditions, inclination towards fluctuation, tendency to disturb relationships, conflicting behaviour, and negative orientation to work and performance. [36] The influence of the relationship with work points out that the relationship of man to work is formed over a long period of time, also through what man gives to work, how he perceives it and can manifest in different ways. In terms of work activity, the attitude of a person is therefore important to the work in general, but also to the work done. If the relationship is positive, work satisfies him/her, there is the possibility of self-realization, work does not burden him, he/she is active, creative, which also positively affects work performance.

In a negative relationship to work, it is the opposite. Man considers work to be evil, therefore he/she does not work properly and considers his/her performance burdensome. [24]

There is a significant relationship between work satisfaction and organizational devotion where one cannot exist without one another. To achieve a high level of job satisfaction, managers need to know and understand what their employees want from work, thereby contributing to increased job satisfaction and reduced job satisfaction. [19]

Survey conducted on a sample of 180 agents at the Mississippi State University Extension Service has shown that those individuals who show high job satisfaction are more concerned with the quality of work done and are more devoted to the organization. [37] According to the results of the study, there is no statistically significant relationship between sex and relationship to work. The research results further showed that there is no statistically significant relationship between the relationship to work and the personality type (the Myers Briggs Type Indicator — MBTI questionnaire). However, the results of the study confirmed that age affects work satisfaction. Older and more experienced individuals show greater job satisfaction and are more dedicated to the organization than younger and less experienced individuals.

According to research, [31] [42] there is evidence that there is a significantly positive relationship between engagement and performance. It states that these employees are more efficient employees.

The relationship between work environments examined characteristics and attitudes towards work. A relationship was found between salary, work experience, teamwork and job satisfaction. They point out that the higher the pay, the work experience the richer together with the informal relationships in the working group, so job satisfaction is higher and the job relationship is more positive, which applies equally to men and women. [23]

The impact of the relationship with work on the performance of the employee is shown in the results, which states that a positive relationship to work brings satisfaction from work and an increase in work performance. [6]

Aim and Object

The aim of the research was to analyse the connection between the relation to work and social intelligence (empathy, manipulation, social irritability) among mayors of municipalities in the Slovak Republic.

As a *hypothesis* it is assumed the existence of a connection between the relation to work and social intelligence (empathy, manipulation, social irritability) among mayors of municipalities in the Slovak Republic.

The subject of the research is social intelligence and relationship to work.

Objects of the research are the mayors of municipalities in the Slovak Republic.

Local self-government is carried out in Slovakia on two levels, namely by municipalities and higher territorial units. There are 2,753 municipalities in Slovakia (31 January 2015– source: Statistical Office of the Slovak Republic). [57] At the head of the municipality, the municipal mayor is elected by the mayor of the municipality for a four-year term of office. The mayor of the municipality is an elected local government official who is expected to be willing and have a professional attitude towards work for the development

of the municipality, as well as the needs and interests of its inhabitants. In the mayor's office, the performance of municipal self-government and local government is linked. [45] [46]

The mayor, as one of the bodies of the municipality, is governed by Act No. 460/1992 Coll. The Constitution of the Slovak Republic in Art. 69, which states that "the mayor of the municipality is the executive body of the municipality; administers the municipality and represents the community externally." [59] The position of the mayor is also regulated by Act No. 369/1990 Coll. on the general establishment, [60] Act No. 253/1994 Coll. on the legal status and salary of mayors of municipalities and mayors of cities, which in para. 2 says that the function of the mayor of the municipality is a public function which is not performed in the employment relationship, i.e. there is no working relationship between the elected mayor and the municipality. [61] Therefore, the mayor does not have a summary of the duties he has to carry out. Its position is characteristic of the performance of the function. According to para. 13 (1) of the Act on General Settlement, the execution of the duties of the mayor is considered to be a public function.

However, the mayor of the municipality does not establish an employment relationship, but the mayor's job defines the tasks he performs on a daily basis in the performance of his duties. It is important for the mayor to achieve a high level of quality work performance. To achieve an optimal level, a positive relationship to work as a performance determinant is necessary. Prosperity and community performance depend to a large extent on the relationship of the mayor to the job and to the function performed.

Methods

The standardized MESI (*M*anipulation, *E*mpathy, *S*ocial *i*rritability) questionnaire was used. It is set up by Frankovský and Birknerová, explores the degree of social intelligence based on psychometric approach in its three factors—empathy, manipulation, and social irritability—in order to obtain empirical data and verify the established hypothesis. [12–17] The questionnaire contains 21 items. The respondent is speaking on a 5-degree scale. The scale anchors vary from 1 never to 5—very often. The score achieved can range from 7 to 35 points for each factor, where 7 points represent a low level of the Social Intelligence Factor and 35 points to a high level of the Social Intelligence Factor. The reliability of the MESI questionnaire shows the calculated Cronbach alpha $\alpha = 0.79$. Reliability of individual factors demonstrates Cronbach alpha values: manipulation $\alpha = 0.831$, empathy $\alpha = 0.857$, social irritability $\alpha = 0.799$. The authors report the reliability of the individual factors: manipulation $\alpha = 0.845$, empathy $\alpha = 0.772$, social irritability $\alpha = 0.725$.

The standardized Job Satisfaction Instrument (JSI) [20] was used to measure the relationship to work; the authors are Brayfield and Rothe. This standardized questionnaire finds a relationship with work and has been used for a very long time since 1951. The questionnaire contains 18 statements expressing the attitude of an individual to his work, of which 9 statements are formulated in reverse. Relation to work is detected on a 5-degree scale. The anchors range from 1—completely disagree (i.e. the respondent disagrees with the statement) up to 5—completely agree (i.e. the respondent agrees with the statement). The score achieved can range from 18 to 90, with 18 points strongly negative to work, and 90 points have a strong positive relationship to work. The questionnaire reliability shows that

the Cronbach alpha values are α = 0.80. The authors reported questionnaire reliability is α = 0.87.

Statistical Analysis

The results of the research were processed using the SPSS 21 statistical software. To test the nature of relationships and dependencies among variables and to test the tightness of the relationship among the studied variables, a correlation analysis was used using the Pearson correlation coefficient, which expresses the degree of tightness of the linear relationship between the two (interval) variables. Through the analyses, we have respected the conditions of use of individual methods.

Results

The aim was to find out the connection between the relationship to work and social intelligence according to its individual factors—empathy, manipulation and social irritability among the mayors of municipalities in the Slovak Republic.

On the basis of the theoretical knowledge, we have formulated the assumption of the existence of links between the relationship to work and social intelligence among the mayors of the municipalities. To obtain the results, Pearson's correlation coefficient (r) was used.

Table 1. *The correlation between the relationship to work and social intelligence.*
[Edited by the author]

Item	Empathy	Manipulation	Irritability
relationship to work	– 0.325**	0.009	0.274**

**(probability value – significance level) p≤0.01; weak correlation <±0.29; middle correlation ±0.30–±0.49, strong correlation ±0.50–±1.0.

Discussion

There is a significant relationship between the two factors of social intelligence, namely empathy and irritability, and the relationship to the function of mayors (Table 1). Significant relationship was not confirmed between manipulation and relationship to work. The findings confirmed the results of several studies, for example [1] [2] [32].

There is a moderately positive relationship between social irritability and work-relatedness, where r = 0.274, p<0.01. The higher the rate of social irritability the mayor gets, the more positive the relationship to the job. Mayors who are characterized by a higher score in the factor of social irritability may make nervous contact with other people. They are socially isolated, they limit social contacts with people. Their presence is irritating, they prefer performing their work independently. They may think they are pursuing their job

at the expense of social relations. And it can also be assumed that a high degree of social irritability predicts the individual work focus of the mayor.

Based on the results of the validation of the MESI questionnaire on the TSIS (The Tromsø Social Intelligence Scale) methodology—a socially irritable individual has a low level of social intelligence. The results of the positive correlation between low levels of social intelligence and work-relatedness are consistent with the results of the research. [3]

A surprising result is the existence of a significantly moderate negative relationship between empathy and work-relatedness. where r = –0.325, p<0.01.

More empathetic individuals experience a higher level of social well-being and at the same time their feeling that they are part of the society and community they live in is stronger. They feel they are important and beneficial for the community and have positive feedback. Mayors scrutinizing the empathy factor know how to recognize the intentions, feelings and weaknesses of other people. I can adapt the concession to people because they are geared to maintaining good interpersonal relationships. [9] [10] [11] They are spontaneously and completely naturally comfortable in the feelings of others, they know how to estimate their problems (both personal and work-problems), while willing to meet these problems and wishes. They can estimate how well people have to adapt and prefer good interpersonal relationships at the expense of work performance. As a result of such a process, it is in our results that we have a negative attitude towards avoiding the work done. [56]

It was found that a higher empathy rate increases the level of work satisfaction and contributes to a positive relationship to work, which does not coincide with our findings. [50] But we have confirmed the results of research that empathy negatively correlates with the relationship to work. [52]

It was found that empathy is negatively related to the relationship to work (the higher the empathy score, the more negative the relationship to work), and that work-related irritability is positively related, while the socially irritable individual possesses a low level of social intelligence that we consider necessary to perform the function of the mayor.

At the same time, it can be said that a low empathy rate and a high rate of social irritability predict individual work orientation, increase work-relatedness, and reduce the level of human orientation and relationships.

The result of statistical testing confirmed the hypothesis only partially. There is a relationship between the factors of social intelligence empathy, social irritability and the relationship to work with mayors of municipalities. There is no relationship between factor manipulation and work relationship with mayors of municipalities.

Conclusion

The results confirmed the relationship between social intelligence in the factors of empathy and social irritability and the relationship with the work of mayors of municipalities. It was found out that:

- the higher the degree of social irritability the mayor achieves, the more positive it is to work. A high degree of social irritability in the mayor of the municipality means inability to act socially, but at the same time indicates a more positive relationship

to work. A socially irritable individual has a low level of social intelligence which we consider necessary for the mayor's office;
- the higher the degree of empathy the mayor has, the more negative the relationship to the job. At the same time, it can be said that a low empathy rate and a high rate of social irritability predict individual work orientation, increase work-relatedness, and reduce the level of human orientation and relationships.

Based on the results, the author of research recommends:
- further exploration of interpersonal competency, social intelligence, and performance relationship. The results are not exhaustive for this explored issue and outline further possible research focus – for example, exploring the motives to serve as mayor of the municipality;
- the self-assessment of the mayors' own degree of social irritability and the subsequent consideration of one's suitability for performance by the mayor and prospective candidate.

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[2] WALLACE J. M., HOBBS P. V.: *Atmospheric Science: An Introductory Survey.* Cambridge: Academic Press, 1977.

For a chapter in a book or monograph
[3] KAUFMANN, S. A., JOHNSEN, S.: Co-Evolution to the Edge of Chaos: Coupled Fitness Landscapes, Poised States, and Co-Evolutionary Avalanches. In. LANGTON, C. G., TAYLOR, C., FARMER, J. D., RASMUSSEN, S.: *Artificial Life II, SFI Studies in the Sciences of Complexity,* 325–369. Boston: Addison-Wesley Publishing Company, 1991.

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