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POLISH LAND FORCES OF THE XXI CENTURY – REFORMS IN ACCORDANCE WITH CURRENT RMA TRENDS

by

Marcin SZYMANSKI

December 2004

Thesis Advisor: Donald Abenheim
Thesis Co-Advisor: Richard Hoffman

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The thesis presents a study of contemporary war and its effects on force structure. It also shows how the US Army has reacted to the changing character of warfare. Such reforms as the Stryker Brigades, Army XXI and "Army After Next" program are analyzed in order to asses which of these solutions can be used in Polish Army reforms. The current capabilities of the Polish Army are also assessed in order to judge the background for military reforms in Poland. Finally a recommendation for reforms in Polish Army is made.

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POLISH LAND FORCES OF THE XXI CENTURY – REFORMS IN ACCORDANCE WITH CURRENT RMA TRENDS

Marcin M. Szymanski
Captain, Polish Army
B.S., Polish Army Officers' School, 1996

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December 2004

Author: Marcin Szymanski

Approved by: Donald Abenheim
                 Thesis Advisor

                 Richard Hoffman
                 Co-Advisor

                 James J.. Wirtz
                 Chairman, National Security Affairs

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The end of the Cold War and the September 11th 2001 attacks changed the strategic environment of the world. New socio- political realities increased the use of armed forces. The War on Terror brought the necessity of expeditionary warfare even to countries, whose security doctrine had been so far exclusively focused on territorial defense. Poland is one such country. Throughout Polish history, there have been no expeditionary operations. New requirements after 1999 generated the necessity for reforms in Armed Forces of Poland. Since expeditionary warfare has never been practiced by Polish Army before, the reform process needs to be strongly coordinated with such military forerunners as the US Army.

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I.   INTRODUCTION - THE BATTLEFIELD OF THE FUTURE

> All planning, particularly strategic planning must pay attention to the character of contemporary warfare.[1]

The end of the Cold War and the attacks of September 11th attacks changed the strategic environment the world over. New socio-political realities have ironically increased the use of armed forces around the globe. The 'War on Terror' made a necessity of 'expeditionary warfare' even for those countries whose security thinking had previously focused almost exclusively on homeland defense. Poland is such a country. Throughout their history, the Poles have never engaged in expeditionary operations. Nonetheless, the global nature of contemporary warfare created new requirements and a necessity for reform in the Armed Forces of Poland, whose character has already changed greatly since the demise of the Eastern Bloc. Since expeditionary warfare has never been practiced by the Polish Army before, it is only sensible to for that country to pay close attention to how the US Army has and is transforming itself for the 'War on Terror.'

This thesis presents a study of the characteristics of contemporary war. It also shows how the US Army reacts to the changing character of warfare. The creation of Stryker Brigades, Army XXI, and the 'Army After Next' program are studied in order to asses which of these solutions employed by the US Army can be used in Polish Army reforms. The current state and capabilities of the Polish Army are also studied in order to provide the necessary background for examining the potential for military reform in Poland. Finally, recommendations for reform in Polish Army are given.

The first chapter describes the theory and practice of contemporary warfare. Chapter II provides a study of the US Army's response to current battlefield requirements. The current state of the Polish Army is examined in Chapter III. Finally, the thesis concludes with recommendations for structural reforms of the Polish Army. Proposed changes are based on contemporary warfare characteristics and experience of the US Armed Forces.

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[1] Von Clausewitz, Carl, *On War*, (Princeton University Press 1989) p. 220

A. NATURE OF MODERN WAR

It is impossible to understand the nature of any change without knowing its reason. Thus the debate on revolution in military affairs should be started from defining its casual factors. Military institutions, like all other organizations, are reforming themselves in order to be more effective in their operational environment. "The environment" in case of armed forces is shaped by the character of contemporary warfare. Its analysis provides opportunity to categorize emerging trends and patterns. This in term enables one to foresee some future developments, which are the key elements for planning military reforms. Within this chapter, I will describe the nature of the present day and the potential future of warfare. I will do it in order to build a base for better understanding of the following debate on the revolution in military affairs.

The end of the Cold War caused a big dilemma among military planners. Since the world ceased to be polarized, there was no more clearly definable threat. NATO forces equipped, trained and organized to fight Soviet regiments, lost their potential opponent. That however did not mean that the military was an unwanted remnant of the past era. Between 1990 and 1996, the US Army deployed troops in 25 operations. In comparison, between 1950 and 1989, the US used their Land Forces only 10 times.[2] Due to these changes in the operational environment, the mission profiles dramatically changed and the troops were not always prepared for the new challenges. Carl von Clausewitz underlined in his book "On War" that "every war is rich of unique episodes; each is uncharted sea, full of reefs."[3] Operations in Bosnia, Rwanda, Somalia, Kosovo, Iraq and Afghanistan were all unique. On the other hand however they had one common feature – they were all very different in their character from any model of warfare defined during the Cold War era. As gen. Cieniuch described it in interview, "contemporary and future conflicts will have much more complex character, they will emerge as an overlapping continuum of events in economic, military, political, environmental and

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[2] Army Vision 2010, www.army.mil/2010/ (Accessed 09.11.2004)

[3] Von Clausewitz, Carl, *On War*, (Princeton University Press 1989) p.120

ethnical spheres."[4] Barge S. Davis also underlined the complexity of contemporary warfare. He wrote that, "multinational humanitarian and military efforts such as those seen in Somalia, Kosovo and Afghanistan are known as Complex Humanitarian Emergencies. These types of emergencies are complex and difficult to operate in because they contain political, military and humanitarian considerations."[5] The complexity is further complicated by so called "gray areas". Max G. Manwaring "noted the rising danger from "gray area phenomena" that combined elements of traditional warfighting with those of organized crime."[6]

At the same time, in current era of mass media, the destructive war will never be justified for public opinion. Russian war in Chechnya is probably one of the last conflict in which the urban areas are leveled to the ground. Robert K. Ackermann mentioned in his article that the US Army "won't have the luxury of destroying the city to save it."[7] Generally speaking, the new character of such warfare emerged from two socio political trends. Firstly - the new world's order created unfavorable conditions for authoritarian regimes. Revolutionary movements in poor countries, often connected with ethnic violence, gave birth to so called "asymmetric warfare". Therefore, peace enforcement operations in such circumstances had very different characteristics from the high intensity warfare approach, dominating in the Cold War era. Most recent operations representing this trend - Somalia, Rwanda and Sierra Leone were all similar in one particular aspect. Highly trained and well equipped armies were confronted by militias, terrorist groups and peoples in arms employing unconventional tactics to reduce the capability gap. The idea of "asymmetry" is so relevant today that it became "a central concept in official American thinking about future warfare."[8] As Lawrence H. Keely described it, "certainly

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[4] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[5] "Field Level Information Collaboration During Complex Humanitarian Emergencies And Peace Operations", Barge, H., Davis M., Schwent, J., (2003), p. V

[6] Max G. Manwaring, ed., *Gray Area Phenomena: Confronting the New World Disorder*, (Boulder, CO: Westview, 1993).

[7] Ackerman, Robert, K., *Echoes of Chechnya Warfare Resound in Moscow, Quantico*, (Report of Center for Army Lessons Learned, 25.02.2002), p. 7

[8] Metz, Steven, Armed Conflict in the XXI Century: the Information Revolution and Post-Modern Warfare, (Strategic Studies Institute, March 2000), p. xi

a smaller, egalitarian society with simple technology and subsistence economy has to conduct warfare differently from a modern highly organized state with a complex technology and surplus economy."[9] The disparity of capabilities and behavior is the main characteristic of "asymmetric warfare", which will be described in more detail below.

The second of the higher mentioned socio political trends was the effect of the growing wealth of states with still unstable leadership. There are still many countries for which war is an acceptable tool of foreign policy. These states enjoy growing access to modern weapons, since their prices have declined. The collapse of the Soviet Union also opened huge opportunities for uncontrolled arms sales. Thus, apart from "asymmetric warfare", contemporary military organizations are facing the threat of confronting the enemy with relatively high standard weapons and training. Such cases occurred during the Gulf War. Gen. Cieniuch underlined that, "despite the current stability in Europe, the high intensity war scenario still can not be disregarded by military planners."[10] In following subchapters I will refer to higher mentioned trends in more detail.

In spite of its diverging characteristics, contemporary warfare has other important facets. The definitions of the battlefield as a two or even three dimensional phenomena become obsolete. Operations today are extended to cyber, economic and psychological spheres. Potential opponents are not only able to engage themselves at the front lines, they go further by attacking lines of communications, home bases, alliances and general interests. These operations are executed through a variety of "non war military operations."[11] Such forms of engagement can include: "cyber, economic, monetary, social, political, cultural, psycho or ecological"[12] aspects. According to Mary Kaldor, "blurring of the distinctions between war, organized crime, and large scale violations of

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[9] Lawrence H. Keely, *War before Civilization*. (New York: Oxford University Press, 1996), p. 10

[10] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[11] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 12

[12] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 12

human rights"[13] is inevitable for future conflicts. These new military approaches are related to the old set of approaches demonstrated by Sun Tzu. Among the others, he wrote in his book "The Art of War" about the sequence of engaging a potential opponent. According to Sun Tzu, it is essential to strike "the enemy plans and alliances"[14] before confronting his army in the field.

The 21st century's warfare has a tendency to be less easily definable not only in terms of the battlefield's dimensions, but also in merging levels of war with each other. As Douglas A. Macgregor declares, "in the future the tactical, operational, and strategic levels of war as separate and distinct loci of command and functional responsibilities will be spaced and timed out of existence."[15] This current trend constitutes that small, tactical level units are more often executing the tasks of the operational or even strategic importance. "The information age" has also made possible, through different levels of command, the ability to take advantage of strategic reconnaissance assets. It is not surprising for anyone who is familiar with the currently run operations that a company level unit receives satellite intelligence data. Satellite navigation has declined to the single trooper level. It is also a common practice to call for indirect fires by the lowest levels of command. The merging of the war's levels will also grant extended responsibility and authority to the lowest levels of command. David Potts in the book "The Big Issue" claims that in future the warfighting will focus on the brigade level. It indicates clearly that the brigade size task forces will be supported by all possible sources, which previously were concentrated at the strategic level of command.

The constant struggle for information superiority will add another characteristic to contemporary warfare. Sophisticated intelligence assets will provide a constant flow of real-time information. Forces in the field will produce a stream of operational and logistic reports as well. This "total awareness" should make a foggy picture of the battlefield

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[13] Mary Kaldor, *New and Old Wars, Organized Violence in a Global Era.* (Cambridge: Polity Press, 1999), p. 70

[14] Sun, Tzu, *The Art of War*, (Barnes & Noble Books, 1994) p. 177

[15] Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997). p. 49

more transparent for modern military leadership. This however also brings the possible danger of information overload. The "fog of war" as David Potts claims, will remain in place. Nothing seems to change the rules established by Carl von Clausewitz – no matter how sophisticated the information system is, "many intelligence reports in war are contradictory; even more are false and most uncertain. What one can reasonably ask of an officer is that he should possess a standard of judgment, which he can gain only from knowledge of men and affairs and from common sense."[16]

The increasing value of the information superiority in modern warfare initiated creation of new sphere – "Information Operations". This kind of military operations, described in more detail in Chapter III, can target "the global information infrastructure (GII), national information infrastructure (NII), and the defense information structure (DII)."[17] As a result, the increasing role of technology in command and control process will also multiply the vulnerability of so called "electronic flank". Chechen rebels already took advantage of such opportunity. Obsolesce of Russian communication equipment enabled rebels to intercept "all helicopter traffic, aircraft communications and satellite telephony."[18] More sophisticated armies are working on cyber warfare capabilities. The so called "computer network attack" (CNA) is designed to "disrupt, deny, degrade, or destroy information resident in computers and computer networks, or the computers and networks themselves. CNA relies on the data stream to execute the attack."[19] The effects of such operations, especially in highly advanced computer – dependant countries can be devastating. According to Libicki, such effects can "range from total paralysis to intermittent shutdown, random data errors, wholesale theft of information, theft of services, monitoring, and the injection of false message traffic."[20]

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[16] Von Clausewitz, Carl, *On War*, (Princeton University Press 1989) p. 117

[17] Caldwell, Russell, j., *Information Operations (io) Organizational Design and Procedures*, (Naval Postgraduate School thesis, March 2004). p. 24

[18] Ackerman, Robert, K., *Echoes of Chechnya Warfare Resound in Moscow, Quantico*, (Report of Center for Army Lessons Learned, 25.02.2002), p. 4

[19] Caldwell, Russell, j., *Information Operations (io) Organizational Design and Procedures*, (Naval Postgraduate School thesis, March 2004). p. 46

[20] Libicki, M. C., *What is Information Warfare?* (Washington, D.C.: National Defense University, 1996), p. 49

With the levels of war merged and the information overload in the extended battlefield, the future of warfare will be also difficult to define in terms of the operation's category. Since the border between war and peace started has begun blur it is harder to categorize military activities into high, low intensity, peace keeping, humanitarian and other conventionally used definitions. Such trends are best described by the "Three Block War" vision developed by the US Marine Corps' Commandant General Krulak. He spoke about the operation, during which within one city, humanitarian, peacekeeping and high intensity warfighting was going on at the same time. Such situations can happen especially in the more complex urban environments; for example, the "Three Block War" would be a US led operation in Somalia.

Another tendency is that the "all arms" concept goes to the lowest levels of command. This tendency has been observed throughout the last two centuries. Douglas A. Macgregor investigates the history of the combined formations throughout history. According to his book "Breaking the Phalanx" such units were organized at levels:

- in 1750, field army level (50,000 troops),

- in 1805, Napoleonic corps (30,000 – 50,000 troops),

- in 1914, infantry division (28,000 troops),

- in 1940, the Panzer Division (14,000 troops),

- in 1945, combat command (4000- 5000 troops).[21]

Close analysis of the character of the contemporary fighting brings me to the conclusion that, the general concept of engagement defined by Clausewitz will not change. Engagement will still "mean fighting", with the object of "the destruction or the defeat of the enemy."[22] Although some can argue that in the era of cyber, economic or psychological operations such a description of engagement may be too narrow; further reading of Clausewitz broadens the term engagement, into the definition covering the

[21] Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997) p. 53

[22] Von Clausewitz, Carl*, On War*, (Princeton University Press 1989) p. 227

new aspects. He explains that "the defeat" of the enemy "simply means the destruction of his forces, whether by death, injury, or any other means – either completely or enough to make him stop fighting."[23] Such broad definition still covers new forms of engagements like those described by Steven Metz. According to him, "future war may see attacks via computer viruses, worms, logic bombs, and trojan horses rather than bullets, bombs, and missiles. Information technology might provide a politically usable way to damage an enemy's national or commercial infrastructure badly enough to attain victory without having to first defeat fielded military forces."[24] Despite the non changing nature of the engagement, the nature of "the mission" is getting a much broader spectrum. The merging of peace and war is challenging the military with a considerably wider variety of tasks. The Army Vision 2010 classifies potential future missions within the following categories: Defending or Liberating Territory, Punitive Intrusion, Conflict Containment, Leverage, Reassurance, Core Security, and Humanitarian Operations. One can clearly see that the classic high intensity fighting becomes just a part of the broad group of possible missions.

Looking at the character of contemporary warfare, one can have an impression that land power is losing its significance at the battlefield. Growing effectiveness of air power, especially its stand-off, precise engagement capabilities suggest that the nearest future may bring a change to the multi service environment, dominated so far by land forces. The air force has become vital, especially in the circumstances where no tolerance exists for friendly casualties. Public opinion, stimulated by the media, is having a great impact on decisions concerning military deployment. Sending ground troops into the theatre always brings the risk of casualties – such risks are often too burdensome for policy makers. According to Steven Metz, "many of today's persistent conflicts, with their roots in ethnic and religious enmity, are difficult to understand and do not seem

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[23] Von Clausewitz, Carl, *On War*, (Princeton University Press 1989) p. 227

[24] Metz, Steven, Armed Conflict in the XXI Century: the Information Revolution and Post-Modern Warfare, (Strategic Studies Institute, March 2000), p. xiii

worth dying for, so minimizing casualties has become a central consideration for military planners, sometimes the preeminent one."[25]

Recent examples of the operations run exclusively by the Air Force include the Kosovo crisis and Desert Fox. In both cases a great deal of criticism evolved concerning the effectiveness of such force structures. Numerous military analysts claim that the "boot on the ground" will never be substituted by any technical mean. As the Army Vision 2010 underlines, "the significance of land power as the force of decision will continue to rise."[26] The land forces deployment is not only confident about the fulfillment of the mission, but also they give a strong statement of the intent. The Army Vision 2010 gives examples of the force compositions in recent operations - they are included in APPENDIX A/1 of Chapter I.

Finally, having the main characteristics of the contemporary warfare defined, one can ask,"what are the potential regions of the world in which the operations can be run within the current century?" Since the political situation in the modern world is changing rapidly, it is not easy to give a precise answer to such a question. Emerging terrorist's threat makes some annalists to think that the future battles may occur within Western Democracies' home lands. As it is stressed by the authors of article "The Changing Face of Warfare", "Fourth Generation Warfare will attempt to attack the west from within and is consistent with the non-Trinitarian style."[27] More optimistic authors of "The Stryker Brigade Combat Team" book are defining five potential areas of operations around the world. This group consists of: Europe, Central America and the Caribbean, Northern and sub- Saharan Africa, Middle East and Southwest Asia, East Asia and the Pacific Rim[28]. These regions vary significantly in climate, terrain, accessibility and the character of their conflicts. Generally speaking, the modern day forces as well as future forces must be

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25 Metz, Steven, Armed Conflict in the XXI Century: the Information Revolution and Post-Modern Warfare, (Strategic Studies Institute, March 2000), p. 17

26 Army Vision 2010, www.army.mil/2010/ (Accessed 09.11.2004)

27 William Lind, Col. Keith F. Nightengale, Capt John F. Schmitt, Col Joseph W. Sutton, Lt Col Gary I. Wilson, "The Changing Face of War: Into the Fourth Generation," *Marine Corps Gazette.* October 1989, Vol 73, #10. p. 22

28 Vick, Alan, Orletsky, David, Pirnie, Bruce, Seth, Jones, *The Stryker Brigade Combat Team*, http://library.nps.navy.mil/Archimages/5169.PDF (Accessed 10.09.2004)/ p. 90

able to operate in climates ranging from the Balkan's winter to the Saharan summer, in terrains ranging from the Afghan mountains to the Amazon jungle. This variety of geographical conditions is further complicated by the nature of the conflicts and the diversification of the missions' profiles.

B.   THE ASYMMETRIC WARFARE

As described on the first pages of this chapter, asymmetric warfare represents one of the two main trends in contemporary warfighting. Such forms of the conflicts are defined by John Russell in the book "The Big Issue". According to his definition, "in asymmetric warfare there is a total or extremely strong difference between the opponents' aims, capabilities, courses of action and moral codes. An asymmetric threat implies that one side is incapable, either due to his own inability or the strength of the force opposing him, of confronting an opponent in a conventional matter, using similar means or weapons."[29] Instead the incapable opponent seeks to engage in an unconventional way, which is difficult to foresee and counter. In such circumstances, the weaker opponent attacks vulnerable areas such as the cohesion of the alliances, public opinion's support, moral values or civilian population. Steven Metz claims that current era is the one "of diversity. For the period of diversity, asymmetry will be a dominant characteristic of armed conflict."[30]

Asymmetric warfare happens mostly in cases when the regular army is confronted by irregular formations or simply by people in arms. This kind of environment is not new in the history of war. Carl von Clausewitz described such situations in his book "On War". According to his point of view, the regular army possesses a set of "military virtues".[31] These are not present in the irregular troops. These "virtues" are customarily

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[29] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 246

[30] Metz, Steven, Armed Conflict in the XXI Century: the Information Revolution and Post-Modern Warfare, (Strategic Studies Institute, March 2000), p. ix

[31] Von Clausewitz, Carl*, On War*, (Princeton University Press 1989) p. 186

built upon values such as: "obedience, order, rules and method."[32] However the values are substituted in "national uprisings and people's wars by natural warlike qualities which develop faster under such conditions."[33] As a result, the asymmetric battlefield is created not only by different combat power qualities – but also it is built on the basis of moral rules' differentiation. Such kind of warfare is very likely to happen in the current era of information age. Economic and political development sped up reforms in democratic countries, although there is still a broad group of underdeveloped states which are at the edge of collapse. According to Steve Metz, "the information revolution has also sped up the pace of change in all aspects of life. Rapid change always has winners and losers. Much of the violence that will exist in the early 21st century will originate from the losers of the change underway today."[34]

Asymmetric warfare is classified by numerous scholars as a final, fourth stage of the warfighting evolution. According to John Russell, "the asymmetrists argue that society's conditions are in place for a change to a new generation of warfare which they term the Fourth (1st – massed manpower, 2nd – massed firepower, 3rd – maneuver)."[35] The same author further stresses that in asymmetric warfare, the opponents will strike themselves in "the political, economic, social and military arenas."[36] Such concept of the broad spectrum engagement is called "a netwar". [37] After having described the general nature of asymmetric warfare, I will now try to define its main characteristics.

In most cases wars are fought over the values of national interest, which are high enough to risk a military confrontation. However the war objectives of both opponents

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32 Von Clausewitz, Carl*, On War*, (Princeton University Press 1989) p.186

33 Von Clausewitz, Carl*, On War*, (Princeton University Press 1989) p.187

34 Metz, Steven, Armed Conflict in the XXI Century: the Information Revolution and Post-Modern Warfare, (Strategic Studies Institute, March 2000), p. vii

35 Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 244

36 Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p.244

37 Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p.244

may be of equal or lesser value. For example one nation may strive for better economic conditions while another nation's intention is merely to survive. Disproportionate values played a significant role in the Kosovo conflict of 1998. NATO had decided to launch an air campaign against the Milosevic regime. The operation began in order to stop the genocide and ethnic brutality in the Balkans. Western democracies used their military power in order to defend human rights and to prevent further destabilization of the region. However for Belgrade regime there was more at stake. The Milosevic built his political support on the "Kosovo Myth" and the "Greater Serbia" idea. The loss of influence in the province would mean for him the end of power. As a result, the Kosovo conflict confronted human values on one side, the survival of a regime on the other. Usually in such situations the country or the coalition with the least dedication is reluctant to commit decisive forces to the conflict. Its opponent however uses every available means to convince the other country that the price to pay is too high for potential benefits. A similar situation took place in the Kosovo case. NATO did not commit ground troops and even restricted air power to certain altitudes in order to avoid air defense fire. The Task Force Hawk is an example: this unit consisted of attack helicopters and ground to ground missiles that were deployed in the Balkans region but were never used during the conflict because of the fear of potential casualties. Although the use of air power finally convinced the Milosevic's regime to give up Kosovo, the operation is still widely criticized for its non decisive character. The price was paid by Albanian population.

Such asymmetry of interest takes place in many conflicts around the world. These circumstances are widely exploited and used by different politicians as policy tools. As John Russell underlined, "in the context of UK and its allies, some adversaries already perceive a disparity of wills which they exploit, for example aversion to casualties and excessive collateral damage, and our sensitivity to domestic and world opinion."[38] The importance of this asymmetry of interest is the highest case of conflict with an opponent having weapons of mass destruction in his arsenal. For example, survival of the state of

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[38] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 248

Israel has already been put at risk a few times in the past century. Hopefully this asymmetry of interest will never reach an extreme level in this region of the world.

According to Carl von Clausewitz, "in the soldier the natural tendency for unbridled action and outbursts of violence must be subordinated to demands of a higher kind: obedience, order, rule and method."[39] This however is not guaranteed in the case of asymmetric warfare. A regular army, representing a set of moral values, may be confronted by an enemy having completely different standards of behavior. Different moral codes may push the enemy to employ extended brutality. According to Keely, what differs modern from primitive warfare is that, "primitive (and guerrilla) warfare consists of war stripped to the essentials: the murder of enemies; the theft or destruction of their sustenance, wealth, and essential resources; and the inducement in them of insecurity and terror."[40] The brutality can be further used to affect the society of a more civilized adversary. Brutality broadcasted through modern media can undermine public support which is so vital for democratically controlled armed forces. Cutting off the heads of American prisoners of war, captured by Iraqi insurgents, and broadcasting it on is a clear signal that the enemy does not follow the moral code of the civilized world. Such activities are targeting public opinion which becomes one of the most important non military aspects of military operations.

Sensitive public opinion, confronted by the opponent with different moral values, creates a favorable environment for terrorism. The bombing of the US Marines' barracks in Lebanon at 1983 left 241 dead and it forced the United States to withdraw the contingent from the region. In this case, the terrorists picked a military target to strike. More recent examples of such activities are much more brutal. The September 11th attacks definitely can be classified as an offensive action in asymmetric warfare between the Islamic fundamentalists' and the modern democracies. Such operations are often used to strike alliances, however these terrorist attacks were targeted against potential allies of the main adversary. Such a case occurred in Spain, where the trains' bombings resulted in

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[39] Von Clausewitz, Carl, *On War*, (Princeton University Press 1989) p. 187

[40] Lawrence H. Keely, *War before Civilization*. (New York: Oxford University Press, 1996), p. 75

the withdrawal of the military contingent from the operation in Iraq. The Spanish attack was perfectly planned and organized during the time of the elections in which one of the parties promised the end of involvement in the operation Iraqi Freedom. The terrorists seem to understand the rule described by Carl von Clausewitz: "one country may support another's cause, but will never take it as seriously as it takes its own. A moderately sized force will be sent to its help; but if things go wrong the operation is pretty well written off, and one tries to withdraw at the smallest possible cost."[41]

The sensitivity of modern societies to collateral damage gives a reason for another trend represented in asymmetric warfare. The enemy with the different set of moral values can use the civilian population in order to stimulate casualties. Excessive collateral damage usually undermines public support for the military operation. The civil population can also be used as "human shields" preventing the military targets from being engaged. Allocating military units within the civilian infrastructure began to be a common practice in contemporary conflicts. Serbs in Kosovo put their military vehicles in villages; they also put groups of civilians on bridges in order to prevent them from being attacked by the aircraft. Somali militants used crowds as a shield against US bullets. Probably the most paradoxical "human shield" happened when the Bosnian Serbs tied the UN observers to the military installations in Bosnia. Such trends indicate clearly that putting ground troops into the theatre for any purpose requires appropriate strength and protection. Otherwise, when one confronts the enemy with a different moral code, he may become a hostage.

The public opinion factor plays a far more important role as a sphere of manipulation for the opponent with different moral values. As mentioned above, it is one of the main pillars of successful military operation. The military, without support, may have to withdraw from the theatre, even when being victorious in the field. Within this whole scheme the media plays a vital role which adds a new dimension to the battlefield. The information age equips most of the households in the civilized world with computers, TVs and radios. The message flow can not be restricted by any means. Thus, the armed

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41 Von Clausewitz, Carl, *On War*, (Princeton University Press 1989) p. 603

forces must pay serious attention to public relations. Civilized society is generally not eager to watch a dead enemy, even in perfectly justified operations. They are much less eager to watch the demise of their own troops. And the worst case happens when the public is confronted with pictures of prisoners of war. Such trends result in modern democracies with almost a maniacal fear of casualties and captives. This fear is well exploited by the adversaries and is an important part of the asymmetric arsenal.

Unconventional engagements are used to counter the technological inabilities. The technology itself however offers the potential for the asymmetric response as well. The most sophisticated weapons often happen to be vulnerable for the most obsolete battlefield systems. In Somalia, the state of art UH60 helicopters were successfully confronted by grenade launchers. The fifty year old RPG was effective enough to shoot down the helicopter. The ordinary "Molotov cocktail" became to be a night mare for the Russian tank crews in Groznyj, when a whole armor division became stuck in the close urban battle. During the same battle, according to Robert K. Ackerman, two rather unsophisticated weapon systems were found "devastating" even against much better equipped enemy: "one is the RPG […], the second is a sniper."[42] Such situations usually happen when the technology is used improperly. Technological superiority gives the illusion of control which often results in arrogant treatment of the weaker adversary. Underestimation and arrogance create an encouraging environment for an asymmetric response with an obsolete weapon system that can be surprisingly effective.

Summarizing the analysis of asymmetric warfare I underline the importance of the statement made by David Potts, according to him, "technology can confer great advantage but it cannot of itself determine the nature, course or outcome of war."[43] It is especially true in an asymmetric environment where a response targets the most vulnerable spheres of modern democracy. Expeditionary operations run up against adversaries having different moral codes and are countered with acts of brutality and determination. Asymmetric warfare gives a variety of means to counter the technological

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[42] Ackerman, Robert, K., *Echoes of Chechnya Warfare Resound in Moscow, Quantico*, (Report of Center for Army Lessons Learned, 25.02.2002), p. 6
[43] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 9

gap. Its arsenal ranges from publicly broadcasted mistreatment of prisoners to sophisticated psychological operations targeting the public opinion. When confronting the opponent by skillfully using such techniques, no modern army may be assured of success. "One who excels in warfare is able to make himself unconquerable, but cannot necessarily cause the enemy to be conquerable."[44] This old statement of the Sun-Tzu seems to be especially valid in the case of asymmetric warfare.

C. THE HIGH INTENSITY WARFARE WITH TECHNOLOGICALLY ADVANCED ENEMY

Many of the warfare analysts claim that the Gulf War was the last conflict of the old era. According to that approach, a classic engagement of two military powers is supposed to be completely substituted by "netwar" and higher described "asymmetric warfare". This however is not the truth. Experience shows that the number of states having relatively high military capabilities is growing. The end of the Cold War and the break up of the Soviet Union gave uncontrolled access to modern weapons for many states. The sheer number of these states is still in a stage of transition to democracy and their foreign policy cannot be predicted in the long run. According to the Army Vision 2010, such countries, "while less capable militarily than wealthy democracies, have access to the most advanced military technology. This phenomenon creates a new danger in the future, i. e., conflict with a nation having a very sophisticated capability."[45] After just a few upgrades, the majority of the old weapon systems can become dangerous tools on the modern battlefield. The T72 with enhanced night vision can still inflict a lot of damage; ballistic missiles operating from mobile launchers can hit targets without being detected as happened during the Gulf War. Commercial, off the shelf technology may also contribute to the sophistication of military forces. For example during Russo – Chechen war, "rebels employed advanced commercial communication systems that

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[44] Sun, Tzu, *The Art of War*, (Barnes & Noble Books, 1994) p. 183

[45] Army Vision 2010, www.army.mil/2010/ (Accessed 09.11.2004)

actually exceeded the quality of the military gear issued to the Russian army."[46] Finally, many of the less developed countries possess the world's highest class of weapons. The Argentinean army, although generally obsolete in comparison to British forces deployed in the Falkland conflict, was still able to sink a Royal Navy destroyer using the Exocet missile. Modern arsenals of less developed states are further enriched by weapons of mass destruction. Although the nuclear weapons are not easily attainable, non military research and production centers can be adjusted easily to produce chemical and biological weapons. The battlefield, in the case of technologically advanced adversaries, is fully extended in all dimensions. Relatively developed opponents can engage in forms of cyber attacks or even in space. Between all the spheres however, in a battle fought by two well equipped foes, the classic maneuver on the field will remain decisive.

Commanding the troops in such an environment, despite all of the high-tech systems will not be easy. Operations will reach an extremely high tempo and initiative accompanied by right judgment at the lowest levels will remain the key to success. Command and control is already highly electronically supported in some armies. High tempo in conjunction with the multi spectrum battlefield will go far beyond the capabilities of a human brain and classic communication means. "The difficulties accumulate and end by producing a kind of friction that is inconceivable unless one has experienced war."[47] The so called Information Operations are designed to reduce "the friction" to a minimum. Command and control functions are executed now more often by systems like the "System XXI" which I described in detail in Chapter II. This technology will be used to gain an information superiority which is described as one of the key preconditions for military success. The Army Vision 2010 stresses that "the information operations conducted to gain information dominance are essential to all the patterns of operation."[48] The US and other highly developed countries are focusing on information technologies in the process of military reform. Following Quadrennial Defense Review 1997/7, ""The ongoing transformation of our (US) military capabilities—the so-called

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[46] Ackerman, Robert, K., *Echoes of Chechnya Warfare Resound in Moscow, Quantico*, (Report of Center for Army Lessons Learned, 25.02.2002), p. 1

[47] Von Clausewitz, Carl*, On War*, (Princeton University Press 1989) p. 237

[48] Army Vision 2010, www.army.mil/2010/ (Accessed 09.11.2004)

Revolution in Military Affairs (RMA)—centers on developing the improved information and command and control capabilities needed to significantly enhance joint operations."[49]

The technology however is changing not only the command and control operational system. Since the last two decades the whole battlefield framework has a tendency for reconfiguration. The developing stand-off engagement capabilities and the sophisticated intelligence assets are shifting the main effort from close to deep operations. Heinz Guderian has already noticed the importance of deep battle as far ago as before World War II. In his book "Achtung Panzer" he underlined that "it is therefore of great importance to strive to bring the entire depth of the enemy defense under simultaneous attack."[50] In today's era and especially in the future full depth engagements will gain essential importance. The UAVs, satellites, cruise missiles and precision guided munitions will definitely shift the focus from close to deep operations. The troops conducting the close battles already have significantly enhanced mobility. Helicopters, state of art vehicles and superb engineer capabilities will definitely erase the word "front line" from contemporary military vocabulary. Deep vertical envelopments and rapid ground maneuvers will further blur the border between close and deep operations. The battlefield framework will most likely change into one complex continuum. Douglas A. Macgregor identified such tendencies already present during the Gulf War. According to him, "for the Iraqi enemy, whose air defenses (ranging from highly sophisticated to antiquated) failed and whose intelligence collection capability was either destroyed or deceived, the deep, close, and rear battles were compressed into one seamless continuous fight."[51]

Numerous analysts claim that contemporary tendencies indicate that future battles will be fought by brigade level units. As I mentioned in the first pages of the chapter, in the future, brigades will have access to strategic and support assets. Tactical level

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[49] Quadrennial Defense Review 1997 sect 7, www.defenselink.mil/pubs/qdr/ (Accessed 10.04.2004).

[50] Guderian Heinz, *Achtung Panzer*, (Brockhampton Press 1999). p. 180

[51] Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997) p. 45

engagements will change their character significantly. Since precision fire support will be available at the lowest levels of command, the focus will shift from direct to the indirect fire. These tendencies will change the basic role of infantryman. The nature of the infantry tactics will change from close fight to the call for fire roles.

The future of armor has been discussed widely since the overall character of warfighting started to change. Main battle tanks were often criticized for their difficult deployment and vulnerability in certain types of terrain. Heavy tanks however have proven their capabilities during operation Iraqi Freedom. Surprisingly, they achieved a great operational success even in urban areas. The Russian experience at Groznyj devalued the tank in the MOUT battles; the US however employed them in a slightly different way. Tanks in urban terrain, according to both – US tactics and common sense, are conducting supportive role to the infantry. Russian catastrophic experience in Groznyj showed different approach. It must be said that in the era of state of the art anti armor weapons, tanks must be equipped with an adequate amount of protection. Fourth generation vehicles represented among the others by M1, Challenger 2 or Leopard 2 possess such characteristics and will remain in the arsenals of the most advanced armies for a long time. According to Heinz Guderian, "the most valuable characteristic of the tank is its capacity to deliver effective and close-range fire against clearly identified targets."[52] This particular statement, in my opinion will prove to be truthful throughout the next century. There has been no weapon system so far that could substitute a tank in close battle. The heavy vehicles proved their value in "stability" and "humanitarian relief" operations as well. Maj. Gen. Montgomery, when relating to unsuccessful Ranger raid in Somalia in October 1993, stated that, "he needed and didn't have armor and APCs in Mogadishu (1993)", he further stressed that he "would have used them on October 3-4 for the rescue, […] we would have taken fewer casualties."[53] Moreover in the present

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[52] Guderian Heinz, *Achtung Panzer*, (Brockhampton Press 1999). p. 183

[53] Lewin, Carl, Senator, US Senate, Warner, John, Senator ,US Senate, *Review of the Circumstances Surrounding the Ranger Raid on October 3-4, 1993, Mogadishu, Somalia*, (memorandum by Committee on Armed Services, Sep 22, 1995), p. 32

and in the future as well, a tank will remain a strong statement of intention. No other weapon in the future will express the level of desperation better than the 60 tone main battle tank.

Although the value of the armored vehicle will not decrease, there are many foreseen changes in its tactical abilities. Carl von Clausewitz claimed that, "there is no higher and simpler law of strategy than that of keeping one's forces concentrated."[54] However in the information age such a statement becomes obsolete. Real time intelligence and precise long- range weapons will force units to disperse. For example during NATO's bombing of Kosovo, the Serbs understood this rule perfectly and due to the dispersion of their units, the sheer majority of their heavy equipment remained untouched. Nevertheless, the concentration is not going to lose its value entirely. In some aspects, modern warfare cannot break its link to classic military thinking. Heinz Guderian wrote that, "as far as ground combat is concerned, we consider that the best chance of success for the offensive in modern warfare lies in deploying armor *en masse*, in suitable terrain and with advantage of surprise."[55] This old rule, being written during the birth of armor will remain steadfast in the XXI century. In the future operational forces will have to remain dispersed. Their vital capability will be to concentrate rapidly on a decisive point, conduct their mission and disperse again.

Forces down to the lowest levels will need to not only move in a geographical space, but also within the organizational structure of the deployed unit. Task forces will also be constantly changing their configuration. In effect, troops, as well as their commanders and logistical specialists will have to be prepared for such changes.

Sun Tzu wrote centuries ago that, "the army values being victorious; it does not value prolonged warfare."[56] This is especially truthful in the present time. Today the armies not only prefer "being victorious", but also public opinion does not tolerate long lasting military commitments. For small, professional armies, "the prolonged warfare"

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[54] Von Clausewitz, Carl*, On War*, (Princeton University Press 1989) p. 204

[55] Guderian Heinz, *Achtung Panzer*, (Brockhampton Press 1999). p. 206

[56] Sun, Tzu, *The Art of War*, (Barnes & Noble Books, 1994) p. 174

means forces overstretched in time, lowered standards for man power through the necessity of calling reservists to the battlefield. This is seen in the case of the US forces in Iraq. Therefore in the future operations will be planned with decisive force and realized with decisive maneuver, which means high tempo and long range relocations of forces. "The Stryker Brigade Combat Team" book gives a good example of extending depth of operations. It is shown in table 1.

Table 1.   Depth in selected operations[57]

Advance to:	Route	Distance (km)
Seoul, Korea 1950	Pusan-Taejon-Suwon	310
Hyesanjin, Korea 1950	Wonsan-Hamhung-Hyesanjin	270
As Samawah, Iraq 1991	Ad Dammam-An Nafud-As Samawah	850
Northern Kuwait 1991	Ad Damman-An Nafud-Northern Kuwait	720
Kigali, Rwanda 1994	Mombasa-Nairobi-Kampala-Kigali	1500
Srebrnica, Bosnia 1995	Ploce-Mostar-Sarajevo-Srebrnica	320
Pristina, Kosovo 1999	Durres-Kukes-Prizren-Pristina	260
Pristina, Kosovo 1999	Thessaloniki-Skopje-Prisitna	295

This growing operational depth will not only challenge maneuver units but it will also require high standards for the logistic echelon. During the operation Iraqi Freedom the logistic echelon could not maintain the pace of the fighting forces. At the same time the Iraqi pockets of resistance presented serious threats to relatively lightly armed convoys. The future of the "rear" requires enhanced mobility and protection reaching the standards of the maneuver units. Except from being mobile and protected the combat

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[57] Vick, Alan, Orletsky, David, Pirnie, Bruce, Seth, Jones, *The Stryker Brigade Combat Team*, http://library.nps.navy.mil/Archimages/5169.PDF (Accessed 10.09.2004) p. 122

service support also has to improve its responsiveness. Systems like the "Total Asset Visibility" will probably substitute entirely classic logistic calculations.

Finally as I mentioned above, easier access to advanced weapons, including weapons of mass destruction will require all forces to be able to fight in contaminated battlefield. Paradoxically, the end of the Cold War increased the risk for a single soldier to be exposed to nuclear, biological or chemical weapons.

Whatever the present and the future state of art technology will bring to the battlefield, high intensity warfare, in its very nature, will always be related to classic military theories. Clausewitz, Sun Tzu, Machiavelli, Guderian and others should always be a guiding force for the officer, no matter if it's now or in the next fifty years. The information age "computerized" the battlefield and gave it one more dimension. Sophisticated technologies, present everywhere, from Corps HQ down to the single tank, are supposed to reduce to the minimum the aspect of uncertainty. On the other hand, can a battle be fought without uncertainty? Advanced technology makes modern forces vulnerable. What if that fails? I have seen too many soldiers lost in the woods because their GPS was down, to underestimate the potential danger of "the digitization". In my opinion as long as the human being will plan warfighting, the uncertainty will be present on the battlefield. Human nature looks to be the only element in future warfare where behavior will never be predictable. Thus as Clausewitz wrote, "not only its objective but also its subjective nature makes war a gamble."[58] Future wars will be fought in an atmosphere full of friction, confusion, opportunities and surprise. High tempo, digitization, deep engagement capability and growing lethality of weapons will require new, carefully planned force structures. Some of these solutions are described in the next chapter

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[58] Von Clausewitz, Carl, *On War*, (Princeton University Press 1989) p. 205

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II. REVOLUTION IN MILITARY AFFAIRS – THE FIRST DECADE OF THE XXI CENTURY (US ARMY CASE STUDY)

The changing character of warfare and emerging new security challenges forced the US Army to initiate a formidable transformation. The first symptoms of the change, as it is mentioned in Chapter I, came occurred after the Soviet Bloc collapsed. The "transformation psychoses" however reached the top after the "War on Terror" had been declared. Shortly before, Secretary Rumsfeld pointed out that, "we must change for a simple reason, the world has, and we have not yet changed sufficiently. The clearest and the most important transformation is from a bipolar Cold War world where threats were visible and predictable, to one in which they arise from multiple sources, most of which are difficult to anticipate, and many of which are impossible to know today."[59] Such statements give a clear indication that future US Land Forces will have to maintain the capability to operate on a short notice all around the globe.

The history of post Cold War expeditionary operations began with the Iraqi invasion of Kuwait. The US response was immediate, although it showed for the first time a serious gap in capabilities. Heavy divisions of the Saddam's Republican Guard took over Kuwait within days. Shortly after, they were ready to push forward into Saudi Arabia. Air power was not enough to address the potential threat, so the US Army reacted with the Divisional Ready Brigade of the 82nd Airborne. Although "the strategic ability was proven when the ready brigade took only two days to deploy and required as few as 26 C-17 sorties", the potential combat effectiveness of this unit against the heavy division looked quite doubtful.[60] After action analysis defined the shortage in capability as a lack of a medium weight force, easily transportable and lethal enough to cope with heavy armored enemy. The old, Cold War force composition left the army polarized; operational units were either too heavy or too light to address full spectrum of emerging expeditionary missions. The shortage further restricted military options nine years later,

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[59] Secretary's Rumsfeld speech 10 Sep 01

[60] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003)

when NATO forces were operating against Serbs in Kosovo. "US planners confronted a wide gap between an air-only effort, which could start almost immediately, and air-ground effort, which would take months to prepare [...]. It would have been too risky to employ airborne and airmobile forces against the Serbs, who had main battle tanks and other armored vehicles."[61] After the Kosovo crisis the problem of force polarization got much attention. The difficulty was addressed vociferously by various officials. In the year of 2000, when the new "Army Vision" began to emerge, General Shinseki wrote, "our legacy Army's warfighting prowess today is assembled around two force characteristics – heavy and light: magnificent heavy forces that are well equipped for war but difficult to deploy strategically, and magnificent light forces that can respond rapidly and are well suited for stability and support operations but lack staying power against heavy mechanized forces..."[62]

Facing an era of rapid, expeditionary operations the US Army initially relayed on the traditional reaction forces – airborne and airmobile units. Those units, while being effective in operations like Grenada, Panama or Haiti, were vulnerable against more sophisticated threats. Potential US adversaries, according to one of the trends mentioned in Chapter one, became more economically developed. Increasing budgets of hostile states in conjunction with growing advanced weapon's market create a dangerous mixture. As a result the expeditionary forces might face well equipped enemy, which cannot be neutralized or even fixed by the traditional light troops. The Research and National Defense (RAND) Corporation noted in their publication "Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions" that, "even with air and attack helicopter support, the current-generation light force proves to be at a significant disadvantage when confronting a capable heavy force."[63] Other weaknesses of the traditional light forces were identified as well. Their lack of protection and mobility put serious restrictions on offensive operations in a modern warfare scenario.

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[61] Vick, Alan, Orletsky, David, Pirnie, Bruce, Seth, Jones, *The Stryker Brigade Combat Team*, http://library.nps.navy.mil/Archimages/5169.PDF (Accessed 10.09.2004).

[62] Shinseki, Eric, K., "The Army Vision: A Status Report", *Army,* October 2001

[63] Matsumura, John, *Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions*, www.rand.org/publications/MR/MR1196.1/ , (Accessed 04.05.2004) p. 5

RAND's study further stated that, "current light forces cannot fully exploit successes of indirect-fire systems by applying maneuver to decisively defeat an enemy."[64] Such characteristic brings a serious disadvantage to the battlefield, especially nowadays, when so much attention is paid to development of precision targeting and indirect fire systems. Knowledge gathered from the lessons learned in operations Desert Shield and Kosovo was enriched by a series of simulations conducted by numerous institutions. One such war game was conducted by RAND: the scenario was set for three cases – the same battle was fought in East Europe, South West Asia and Latin America. A conventional light brigade, with the TOE of the 82nd Airborne, was fighting a defensive battle against an armored division. The conclusion from the war game, although the results varied slightly according to the terrain type, was one: "in all scenarios the DRB (divisional ready brigade) loses the battle."[65]

Thus the transformation, begun by the Goldwater-Nichols act in 1986, picked up steam in 2000. Secretary Rumsfeld underlined in 2002 that, "in a new security environment, unless we transform this institution (the Army), we will not be able to provide security for the American people."[66] In order to set the general directions of the reforms the Secretary of Defense released six operational goals for the military:

1. protect the US homeland and defeat weapons of mass destruction and their means of delivery,

2. project and sustain power in distant, anti-access and area denial environments,

3. deny enemy sanctuary by developing capabilities for persistent surveillance, tracking and rapid engagement,

4. leverage information technologies and innovative network-centric concepts to link joint forces,

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[64] Matsumura, John, *Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions*, www.rand.org/publications/MR/MR1196.1/ , (Accessed 04.05.2004) p. 158

[65] Matsumura, John, *Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions*, www.rand.org/publications/MR/MR1196.1/ , (Accessed 04.05.2004) p. 7

[66] Secretary Rumsfeld's Town Hall Meeting Speech 21 Aug 2002

5.   protect information systems from attack,

6.   maintain unhindered access to space and protect US space.[67]

Having such goals defined and being aware of the expeditionary capability gap, the US Army planners started to work on the shape of the new, more responsive forces. Initially three potential solutions were outlined: the current light forces could be reduced to smaller elements with enhanced C2 systems capable of coordinating advanced indirect fire systems, the current light forces could remain in the present structure while being equipped with advanced surveillance and target acquisition means, and finally the current light forces could be made more maneuverable and protected by introduction of more capable, easily deployable vehicles.

The last option gave birth to the Stryker Brigade Combat Team Concept (SBCT). The idea of equipping light brigades with armored vehicle was evaluated during numerous simulations. It disqualified the concept of the small, dispersed light troops, since their survivability occurred to "suffer more in the direct-fire battle because the larger perimeter resulted in less efficient overlapping fields of acquisition and fire."[68] The SBCT concept, although requiring, "by far the most significant change to current forces"[69] was still considered the best option in the long term perspective. "Not only would it mean a complete reequipping of at least a portion of today's ground forces, it would also entail a reorganization of how such a force would need to fight, including changes in training and doctrine."[70] Despite this fact, as the table in APPENDIX B/1 shows, the trade off was still attractive. Light forces equipped with vehicles presented increased capabilities in three out of five measured parameters. Moreover the whole idea of the medium weight deployable force was also used to construct the first designs for the "Objective Force". As a result, the SBCT gained additional value by "providing an

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[67] Quadrennial Defense Review 2001, www.comw.org/qdr/qdr2001.pdf (Accessed 27.07.2004)

[68] Matsumura, John, *Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions*, www.rand.org/publications/MR/MR1196.1/ , (Accessed 04.05.2004) p. 118

[69] Matsumura, John, *Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions*, www.rand.org/publications/MR/MR1196.1/ , (Accessed 04.05.2004) p. 155

[70] Matsumura, John, *Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions*, www.rand.org/publications/MR/MR1196.1/ , (Accessed 04.05.2004) p. 155

organization for developing concepts for the Objective Force."[71] This structure, planned to be operational in 2010, is defined as Future Combat System which is "currently explored in a joint program by the Army and Defense Advanced Projects Agency"[72]

A. THE STRYKER BRIGADE COMBAT TEAM CONCEPT

U.S. Army Field Manual 3-21.31 gives the best description of the Stryker Brigade concept. According to this source, "The SBCT is a full spectrum combat force that has utility in all operational environments and against all threats. The SBCT provides significant capabilities as a subordinate maneuver element to division or corps commanders in major theater war (MTW)."[73] Such advantage is achieved thanks to the enhanced mobility, survivability and lethality in comparison with traditional light forces. At the same time the SBCT is more easily deployable when compared to the current heavy troops. Maj. Adam L. Rocke in his thesis "Is The Stryker Brigade Combat Team a Viable Concept", further defines the unit as "a more strategically responsive force that can more rapidly deploy and effectively operate in all types of military operations, whether small scale contingencies or major theatre wars."[74] The flexibility mentioned above was achieved through equipping the light infantry with armored vehicles. This way, the light troops shared to some extent the advantages of increased mobility and protection restricted so far to mechanized infantry. In sum, as authors of "Speed and Power, Towards the Expeditionary Army" described that, the Stryker Brigade provides "another option on the deployment closure time versus combat power tradeoff curve."[75]

Stryker vehicle, shown on pictures in APPENDIX B/2, was developed by General Motors. The manufacturer, according to the initial contract, was obliged to build the

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[71] Vick, Alan, Orletsky, David, Pirnie, Bruce, Seth, Jones, *The Stryker Brigade Combat Team*, http://library.nps.navy.mil/Archimages/5169.PDF (Accessed 10.09.2004) p.7

[72] Vick, Alan, Orletsky, David, Pirnie, Bruce, Seth, Jones, *The Stryker Brigade Combat Team*, http://library.nps.navy.mil/Archimages/5169.PDF (Accessed 10.09.2004) p. 9

[73] FM 3-21.31, *The Stryker Brigade Combat Team*, www.globalsecurity.org/military/library/policy/army/fm/3-21-31/ (Accessed 12.06.2004) p.5

[74] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003)

[75] Peltz, Eric, Halliday, John, M., Bower, Aimee, *Speed and Power Toward an Expeditionary Army,* (RAND), www.rand.org/publications/MR/MR1755/ (Accessed 17.06.2004) p. 87

vehicle based on the LAV chassis. The Stryker originally was to be made in nine versions: infantry carrier, reconnaissance, anti-tank, mortar, command, fire support, engineer, NBC protection and medical. Furthermore, the direct fire vehicle, called the Mobile Gun System is still in the development phase. One of the main restrictions in the vehicle construction was that it could not exceed 19 short tones weight. Such characteristics, combined with the size, enable the Stryker to be transported aboard the C-130 and all other transport aircraft in the US Air Force inventory. Survivability, lacked by traditional light troops is achieved by the vehicle's armor, which is estimated to "offer ballistic protection from .50 caliber bullets and protect against 152 millimeter airburst shells."[76] Enhanced lethality of the infantry squads is achieved thanks to the ".50 caliber and MK19 mounted on the Remote Weapons Station."[77] Additionally, the mobility of the Stryker enables the units to conduct marches with sustained speed of the 30-35 miles per hour[78]. Equipping whole brigades with such a platform creates range of new capabilities. Ease of deployability is accompanied by the ability "to operate against conventional or unconventional enemy forces in all types of terrain and climate conditions, and all operational environments."[79] One of the few so far identified limitations is that the SBCT is "not a forced entry capability, it's an early entry capability."[80] Nevertheless, the achievements are still impressive not only for military specialists but for policy makers as well. Thus it is not surprising that in 2002, Secretary of the Army Thomas E. White insisted on accelerating the "introduction of forward stationed interim brigade combat teams."[81]

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[76] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 47

[77] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 48

[78] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 54

[79] FM 3-21.31, *The Stryker Brigade Combat Team*, www.globalsecurity.org/military/library/policy/army/fm/3-21-31/ (Accessed 12.06.2004)

[80] Media Roundtable 2002, 13

[81] Quadrennial Defense Review 2002, www.comw.org/gdr/qdr2002.pdf (Accessed 12.09.2004), 27

Forward stationing of the brigades is a result of their deployment time schedules. The medium weight of the SBCT and their location will enable the Army to deploy such force "anywhere in the world in 96 hours after lift off."[82] On the other hand, ambitious plan of forward stationing has many critics. Authors of the book "Speed and Power Toward an Expeditionary Army" wrote that, "Forward unit positioning can provide significant value, but it imposes costs, which must be balanced against the benefit. Beyond cost, the issue of feasibility can arise as well. The decision process should start with a review of regions where fast-response capability is desired."[83]

The "96 hour" rule is a part of a the bigger deployment capability plan, according to which the Army wants to be able to put one full division on the ground within 120 hours and five divisions in 30 days time. The goal looks to be achievable in the SBCT case, especially because of the relatively light weight of the whole brigade. The weight comparison is shown in the APPENDIX B/3. Comparing the tonnage of the units, one can clearly see the advantage of the SBCT. According to GAO's Report to Congressional Committees, "the amount of airlift that would be needed to deploy a Stryker brigade would be about one-half of the airlift aircraft needed to deploy a heavy armored brigade. Based on the deployment planning assumptions the Army uses, about 243 C-17 strategic airlift sorties would be needed to airlift a Stryker brigade, compared to about 478 C-17 sorties needed to airlift a heavy armored brigade."[84]

Additionally forward basing is placed in such regions that put the SBCT's in reach of most of the potential trouble spots around the globe in 96 hours. Current location of the SBCT's is shown on APPENDIX B/4.

The brigades were fielded in two phases: in the first phase, in fiscal year 1999, the first two SBCT's were positioned at Fort Lewis in Washington State; within the second phase, which is currently going on, four remaining brigades will be organized in the

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[82] Vick, Alan, Orletsky, David, Pirnie, Bruce, Seth, Jones, *The Stryker Brigade Combat Team*, http://library.nps.navy.mil/Archimages/5169.PDF (Accessed 10.09.2004). p. 1

[83] Peltz, Eric, Halliday, John, M., Bower, Aimee, *Speed and Power Toward an Expeditionary Army,* (RAND), www.rand.org/publications/MR/MR1755/ (Accessed 17.06.2004) p. 70

[84] United States General Accounting Office, *Military Transformation Realistic Deployment Timelines Needed for Army Stryker Brigades*, (Report to Congressional Committees GAO**,** June 2003) p.6

remaining four bases[85]. Moreover, "the Army is planning for the relocation of one Stryker brigade to Europe in fiscal year 2007."[86] On the other hand however, some analysts claim that the 96 hours goal is unrealistic for the SBCT and they point out that it has not been proven yet. Maj. Adam L. Rocke writes in his thesis that, "even if the appropriate aircraft were available to adequately resource the SBCT, there are a host of other factors outside the control of force designers, that prevent a ninety six hour timeline being met as stated in the most recent Rand Study on the SBCT. Some of these additional factors entail things such as MOG, MHE availability, crews availability, distances, and refuel capability."[87] Achieving the 96 hours deployment goals will be difficult in the future as well. Today army planners put serious doubts whether the potential successor of the SBCT will be able to meet such high standard. Authors of the book "Speed and Power Toward an Expeditionary Army" claim that, "given the Army's draft Unit of Action (the basic brigade-sized maneuver element of the future force) design, achieving the 96-hour goal will remain challenging."[88]

Despite the reasonable doubts, the SBCT in terms of the deployment capability related to lethality, mobility and protection of the unit, still has a revolutionary advantages. Although the brigades have not been transported as a whole element in the given 96 hour timeline, some of their subunits already presented their deployment capabilities. Another GAO's Report to Congressional Committees, describes one of the exercises of the SBCT: "Tactical deployment was demonstrated when C-17 aircraft transported an infantry company from Lake Charles to Geronimo forward landing strip, an austere dirt airfield at the Joint Readiness Training Center. The C-17 aircraft landed at the forward landing strip, and the infantry company demonstrated the ability to quickly unload its vehicles and personnel by moving to the tactical assembly area in about 10

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[85] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 27

[86] United States General Accounting Office, *Military Transformation Realistic Deployment Timelines Needed for Army Stryker Brigades*, (Report to Congressional Committees GAO**,** June 2003) p.5

[87] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 46

[88] Peltz, Eric, Halliday, John, M., Bower, Aimee, *Speed and Power Toward an Expeditionary Army,* (RAND), www.rand.org/publications/MR/MR1755/ (Accessed 17.06.2004) p. 62

minutes."[89] Careful approach to deployment problems is also expressed by functions of the personnel manning the SBCT. Stryker Brigades have "the Army's first Mobility Warrant Officers (one per SBCT)."[90]

However the ability of the SBCT for rapid deployment and effective combat operations immediately on arrival is not achieved thanks to light weight only. It is also due to the unique organizational structure of the brigade. Although the whole structure is shown at APPENDIX B/5, there are some elements that deserve additional comment. Beginning with the command and control battlefield operational system, the SBCT's capabilities are significantly enhanced by the digitized C2 process. All command levels as well as single vehicles are planned to be equipped with the Force XXI Battle Command Brigade and Below (FBCB2) devices. The system is described in more detail in the next subchapter, since it is in use in Force XXI units. The "network-centric" approach however creates some problems too. One such problem is the high price of the elements and their technical sophistication which requires contractors for maintenance and repair. According to GAO's Report to Congressional Committees, "not all Stryker vehicles have the digital FBCB2. This system increases a commander's ability to position troops and conduct combat operations. The issue is that only one half of the Stryker vehicles in each infantry platoon currently have the FBCB2 system. The mitigation plan calls for procuring a sufficient number of FBCB2 systems for the initial Stryker brigade, but the plan does not address if FBCB2s will be procured to equip all Stryker vehicles in the future brigades."[91] Following the same source, the digital link to the dismounted infantry has not been introduced so far. This fact, in conjunction with the high speed character of the SBCT operations, creates a potential difficulty in coordination at the lowest levels of command. "The total battlefield awareness" is further pursued by the sophistication of the organic reconnaissance assets of the SBCT. According to Maj Adam

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[89] United States General Accounting Office, Military Transformation The Army and OSD Met Legislative Requirements for First Stryker Brigade Design Evaluation, but Issues Remain for Future Brigades, (Report to Congressional Committees GAO, December 2003) p.16

[90] Peltz, Eric, Halliday, John, M., Bower, Aimee, *Speed and Power Toward an Expeditionary Army,* (RAND), www.rand.org/publications/MR/MR1755/ (Accessed 17.06.2004) p. 67

[91] United States General Accounting Office, Military Transformation The Army and OSD Met Legislative Requirements for First Stryker Brigade Design Evaluation, but Issues Remain for Future Brigades, (Report to Congressional Committees GAO, December 2003) p. 7

L. Rocke, "the RSTA squadron has four unmanned aerial vehicles, with two having the capability of being airborne at all times."[92] Such capability gives an advantage of the continuous flow of the real time, over-head intelligence. The data, spread down to the lowest levels via the FBCB2 provides a realistic chance to achieve information superiority in the early stages of the operation. As the APPENDIX B/5 shows, the brigade has three maneuver battalions. Significant for the maneuver battle operation system (BOS) is that the task organization went down to the company level. Although the Armored Gun System (AGS) is still under construction, the Brigade's structure includes three of these systems per each company. The TOE of the company is shown at the APPENDIX B/6. In terms of the anti armor capability, the SBCT enjoys higher number of the Javelin systems than the current light brigades. The SBCT is also equipped with the improved TOW2B, having ITAS tracking system. The brigade has also a different organizational solution for the anti armor assets. According to maj. Adam L. Rocke, "in case of the SBCT an anti tank (AT) company under the brigade control comprises the BCTs primary tank killing capability. In the case of the light infantry BCT, there are three AT platoons that comprise the anti tank killing capability. While the manpower strength and weaponry of both is almost equal, the flexibility of the SBCT at the brigade level clearly offers more flexibility."[93] In terms of organic fire support, the SBCT is much more heavily equipped than its traditional light infantry counterpart. Starting at the lowest levels, "the SBCT has more in terms of raw numbers along with the larger caliber and increased ranges […]. At the battalion level there is a significant difference as well. The SBCT has four 81 millimeters mortars and four 120 millimeter mortars, […] as compared to four 81 millimeter mortars in a light infantry battalion."[94] Mortar fire can also be more intense, since the Stryker mortar vehicle crew can operate the weapon mounted. The brigade level fire support is basing on the Artillery Battalion, equipped

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[92] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 35

[93] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 51

[94] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 50

with 12 155mm M198 Howitzers. As Maj. Rocke underlines, the battalion does not have organic CSS assets, thus "it requires all CSS from the brigade support battalion (BSB) while the BSB requires augmentation from echelon above brigade elements to provide field services."[95] The whole process of cutting down the brigade's weight in order to achieve an easy deployable configuration reduced the CSS structure to almost minimum. The BSB looks to be overloaded with dual task of supplying the troops and linking with the level above brigade. During one of the test exercises at the NTC, "the brigade support battalion struggled to perform its dual function of acting as a conduit for its requests and the distribution point for supplies between the echelon above brigade support structure and the brigade. One difficulty faced by the support battalion was the need to reconfigure supplies received from the echelon above brigade support structure. Unit supply requests did not adequately reflect its needs; therefore, the anticipatory loads sent from the echelon above brigade support structure did not contain the correct supplies in the correct amounts and configurations."[96] Having one vehicle for all functions makes maintenance easier; it however does bring vulnerability in the CSS sphere. What if after a few years of exploitation the vehicle platform would occur non reliable? What if the potential enemy finds the weak spot of the vehicle?

In addition to logistics, there are some other weaknesses of the SBCT. The Brigade does not have organic anti-aircraft assets. Instead it relays "on small arms and crew served weapons, bolstered heavily by an air cap."[97] This deficiency clearly shows that the US Army does not intend to deploy the SBCT anywhere without total air superiority. Furthermore it is questionable whether a brigade without organic NBC assets is seriously prepared to fight in a contaminated environment.

It is thus apparent that there were numerous trade offs made to allow the SBCT to more deployable. Although the unit has seemingly achieved (and even this is in dispute)

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[95] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 40

[96] Report to Congressional Committees GAO December 2003, MILITARY TRANSFORMATION, "The Army and OSD Met Legislative Requirements for First Stryker Brigade Design Evaluation, but Issues Remain for Future Brigades" p. 25

[97] Rocke, Adam, L., *Is The Stryker Brigade Combat Team a Viable Concept?*, (US Army Command and General Staff College, thesis 2003) p. 40

the 96 hours deployment goal it also has some serious limitations. The structure and the equipment look "near perfect" for fighting counter-insurgency or asymmetric warfare. The combat power of the brigade would be seriously tested however by a more sophisticated threat. Nonetheless, most likely future combat scenarios for the US Army seem to be in the Low-Intensity to Mid-Intensity variety. The SBCT fills the gap between the light and heavy forces and as the current operations in Iraq show it is capable of carrying tasks for which it was designed. The feasibility of the concept is further confirmed by sheer interest of foreign armies. Polish General Staff has already studied the idea with great interest. As general Cieniuch described it, "such untraditional mixture of armament and structures resulted in attractive compromise between weight, mobility and firepower of the unit."[98]

B.   ARMY XXI CONCEPT

Although the Stryker Brigades is a valuable component of the US Army full spectrum capabilities, its operational characteristics does not make it capable of addressing all kinds of potential threats. In case of high intensity warfare with a relatively well equipped opponent, heavy units are still essential. Despite their cumbersome deployment characteristics, the protection, firepower and mobility of mechanized and armor brigades make them unique and invaluable. Numerous analysts recently argued that the Russian experience in Chechnya taught that heavy troops were not suited for fighting in MOUT. On the other hand however, US operations in Baghdad and British experience in Basra proved that armor units, when wisely deployed, have a great advantage even in the MOUT environment. Maj. Gerald A. Boston claimed in his thesis that "the current heavy force is capable of implementing most of the DOC subsumed under dominant maneuver, precision engagement, focused logistics and full-dimensional protection."[99] He further underlined that "the current heavy force is extremely relevant today, as demonstrated on Operation Iraqi Freedom and will remain so for the next 15-20

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[98] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[99] Boston, Gerald, A., *Extending The Operational Relevance of The Current Heavy Mechanized and Armor Force to 2020 and Beyond*, (US Army Command and General Staff College, thesis 2003) p. 28

years."[100] Thus it is not surprising that these forces are an important part of the US Army transformation process and so far nobody talks about their abolition. The modernized heavy component, called "Legacy Force", is after the medium brigades the second stage of the transformation to "Objective Force" of the year 2020. The three step approach was declared in "A Statement of the Posture of the United States Army 2000". Authors of the document described the heavy units' modernization as a "third element of transformation"[101]. The report further states that the reform will be done through "modernization and recapitalization of existing platforms within our current force – the Legacy Force – to provide these platforms with the enhanced capabilities available through the application of information technologies."[102] The advantage for modernization of the heavy force is that it does not require new weapon systems or platforms. It is "with a few exceptions, […] software, as opposed to hardware, revolution for the US Army."[103] The central problem for introduction of the Stryker Brigades was fielding new vehicles and adjusting current tactics to their capabilities. In case of the Force XXI (as the new heavy force is called), focal point is to switch from "warfare based on platforms (platform centric warfare) to warfare based on networks of interconnected platforms (network centric warfare)."[104]

In such case however, before one is able to fully understand the nature of change it is necessary to discuss a few key terms. Network centric technologies are employed in information environment in order to get the information superiority. The superiority in this sphere becomes to be as important as the control of the sky. The 'Information Environment' is defined as "the aggregate of individuals, organizations, or systems that

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[100] Boston, Gerald, A., *Extending The Operational Relevance of The Current Heavy Mechanized and Armor Force to 2020 and Beyond*, (US Army Command and General Staff College, thesis 2003) p. 28

[101] "A Statement of the Posture of the United States Army 2000"

[102] "A Statement of the Posture of the United States Army 2000"

[103] Nichiporuk, Brian,. *Forecasting The Effects of Army XXI Design Upon Multinational Force Compatibility*, (arroyo center), www.rand.org.publications/DB/DB279/DB279.pdf (Accessed 08.06.2004), p. 9

[104] Nichiporuk, Brian,. *Forecasting The Effects of Army XXI Design Upon Multinational Force Compatibility*, (arroyo center), www.rand.org.publications/DB/DB279/DB279.pdf (Accessed 08.06.2004), p. 11

collect, process, or disseminate the information; and also includes information itself."[105]
Application of computer based technologies, described above, would give an overwhelming advantage over the conventional opponent. Such advantage is defined as "information superiority", which means: "the operational advantage derived from the ability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying adversary."[106] All activities with the purpose of achieving such an advantage are called "information operations", which in accordance with Army Vision 2010 are "conducted to gain information dominance, essential to all the patterns of operation. They consist of both offensive and defensive efforts to create a disparity between what we know about our battlespace and operations within it and what the enemy knows about his battlespace."[107] The importance of information operations is appreciated not exclusively by regular, highly developed troops. According to Robert K. Ackerman during Russo – Chechen conflict, "information operations proved to be the key element of urban warfare. Russian forces also were subjected to massive onslaughts of disinformation."[108] The report of US Army Research Institute for Behavioral and Social Sciences broadens the term "information dominance". According to this document it results from "situational awareness and situational understanding, layered on foundation of basic tactical skills."[109] In other words, "the awareness" is assured through continuous flow of the accurate, real time information; the understanding is the ability to interpret a wide context of the battlefield picture. According to Steven Metz the "awareness" is a key to the speed and dynamics of operation. He stated that, "tactical and

[105] FM 3.0 Operations 1-4

[106] FM 3.0 Operations 1-4

[107] Army Vision 2010 „Information Superiority"

[108] Ackerman, Robert, K., *Echoes of Chechnya Warfare Resound in Moscow, Quantico*, (Report of Center for Army Lessons Learned, 25.02.2002), p. 4

[109] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US   Army Research Institute for Behavioral and Social Sciences 2002) p. 41

operational speed comes from information technology, the "digitized" force, and appropriate doctrine and training."[110]

It is important to understand the capability gap in order to judge the SBCT concept – understanding of the higher mentioned definitions is similarly essential to properly conceive of the intended nature of change in the heavy forces. That is, what exactly is "Force XXI"? The RAND document describes it as a unit operating "current systems enhanced with information age technology."[111] The same publication further says that "it is rooted in the US Army's Air Land Battle doctrine, and some of its aspects were already fielded in Iraq in 1991. Eventually the entire Army is expected to have Force XXI capabilities."[112] The "Force XXI" capability, namely a digital C4I system is basing on information technology. Employment of such technologies to military structures remains the key for future reforms. According to Steven Metz, "today technology, particularly information technology, is the locomotive, defining what is possible and pushing old ideas, values, methods, and organizations into obsolescence."[113]

The initial plan for creating new types of units assumed that the first division would be fully digitized by the year 2000. The first corps level digital structure was to be completed by the end of 2004. In reality however up to this day only the 4th Infantry Division has achieved Force XXI standards (which is still a great achievement). The broader plan of Army modernization (as mentioned in Army Vision 2010), assumes that units like 4th ID will remain with their present equipment and structures until 2020, when the first 'Army After Next' components become operational. This high tech unit, which is described in more detail in the following subchapter, will be a core of the expeditionary

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[110] "Armed Conflict in the XXI Century: the Information Revolution and Post-Modern Warfare", Steven Metz, p. xv

[111] Zaini, Michele, Morison Jennifer, Taw,. *The Army and Multinational Force Compatibility,* www.rand.org/publications/MR/MR1154/ (Accessed 06.06.2004), p. 1

[112] Zaini, Michele, Morison Jennifer, Taw,. *The Army and Multinational Force Compatibility,* www.rand.org/publications/MR/MR1154/ (Accessed 06.06.2004), p. 1

[113] "Armed Conflict in the XXI Century: the Information Revolution and Post-Modern Warfare", Steven Metz, p. 5

force, with "Army XXI units forming the more conventional follow-on component."[114] Currently, from organizational point of view,

Currently the 4th ID operates conventional weapon platforms, common to the rest of the US Army heavy units. They are equipped with M1A2, M2A3, AH64D, Paladins and MLRS, their utility however is highly increased through the enhanced C4I system enabling to better "acquire, exchange, and employ timely data throughout the operational area."[115] In other words the advantage of the Force XXI units over the other units comes from "its robust C4I capabilities to facilitate the accurate and constant (as opposed to pulsed or surged) application of operational capabilities."[116] The change is highly shaped by application of the network centric command and control system. The Army Battle Command System (ABCS) is the core element of the optimization process. The ABCS, called "a system of the systems" is designed to "provide command and control from the individual soldier up to the theater ground force component commander and beyond. The ABCS will use broadcast battlefield information, including real time data on friendly and enemy locations as well as information from other sources, to create a graphical depiction of the operation."[117] The ABCS used in the 4th ID works on the basis of the field internet. Command levels, from the division commander down to the single vehicle platform are equipped with working stations consisting of the screen and control unit. Everyone is able to see the graphical depiction of the currently run operations. Everyone is also able to insert locations of the enemy units or other obstacles. Such arrangement assures the total awareness down to the lowest levels.

The ABCS manages a few subsystems, among others is the Force XXI Battle Command Brigade and Below (FBCB2). This net, used also in the Stryker Brigades, enables the lowest levels to obtain input information into the system. The FBCB2,

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[114] Zaini, Michele, Morison Jennifer, Taw,. *The Army and Multinational Force Compatibility,* www.rand.org/publications/MR/MR1154/ (Accessed 06.06.2004), p. 2

[115] Zaini, Michele, Morison Jennifer, Taw,. *The Army and Multinational Force Compatibility,* www.rand.org/publications/MR/MR1154/ (Accessed 06.06.2004), p. 14

[116] Boston, Gerald, A., *Extending The Operational Relevance of The Current Heavy Mechanized and Armor Force to 2020 and Beyond*, (US Army Command and General Staff College, thesis 2003) p. 29

[117] Zaini, Michele, Morison Jennifer, Taw,. *The Army and Multinational Force Compatibility,* www.rand.org/publications/MR/MR1154/ (Accessed 06.06.2004), p. 14

"through the graphic interface known as the appliqué, provides battlefield information to soldiers by integrating data from GPS and weapons sensors aboard tanks, scout vehicles and other platforms and from external updates via its digital radio link to an Internet like data sharing network."[118] This network centric approach changed the way the army operates; even though the change does not have a revolutionary scale. It is rather a step towards the real RMA supposed to be brought by AAN implementation. As one of the RAND publications underlines, "despite the technological advances represented by Force XXI, we do not believe that it is a full-blown military innovation; rather it is an important but incremental move forward from the current Army of Excellence."[119]   The new command and control concept created new capabilities as well as so far unknown vulnerabilities. Those are often called the "electronic flank"[120].

Starting with the advantages of the digitized Force XXI, chief among them is the ability to fight a highly dynamic aggressive battle with a little time spent for coordination of highly synchronized warfare. As it is underlined in publication by the Army Research Institute for Behavioral and Social Sciences, "enhanced situational understanding is enabling remarkably bold and aggressive maneuver. The precision of the common operating picture gives leaders the confidence to move quickly and decisively."[121] Dynamic and precise maneuver is possible thanks to the other characteristics of the digitized concept. Situational understanding enhanced by the constant real time data flow reduces the time spent on decision making to the minimum. At the same time the planning supported by the electronic systems is more precise. Authors of the higher quoted publication state further that, "digital capabilities have significantly facilitated the planning process. They enable the commander and his staff to develop and rehearse a

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[118] Zaini, Michele, Morison Jennifer, Taw,. *The Army and Multinational Force Compatibility,* www.rand.org/publications/MR/MR1154/ (Accessed 06.06.2004), p. 14

[119] Nichiporuk, Brian,. *Forecasting The Effects of Army XXI Design Upon Multinational Force Compatibility*, (arroyo center), www.rand.org.publications/DB/DB279/DB279.pdf (Accessed 08.06.2004),, p. 12

[120] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p.199

[121] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US   Army Research Institute for Behavioral and Social Sciences 2002) p. 40

plan with several courses of action, something rarely done without digital tools."[122] Such ability gives commanders the chance to get into the enemy decision making cycle by pressing with own initiative. In other words the new C4I system not only enhances the tactical ability to mass effects but also gives a big advantage to operational level command structures. The ability to react in a dynamic fashion is further enhanced by the relatively easy force tailoring. Troops reorganizations, assembling and staging, which sometimes was even more difficult than warfighting itself, is not so difficult in digitized units. According to RAND, the Force XXI concept "enable better and faster force tailoring of deployed battle groups so that, once in theater, these combined arms task forces can deploy directly to combat without spending much time in intermediate staging and assembly areas."[123] Digitized tools also enable forces to conduct more dispersed operations. The significant change in the sphere of the tactics is that the digitized force commanders are more comfortable fighting with gaps in their formations. Sensors, real time intelligence and the ability to react quickly are making dispersed battle easier to manage. "Electronic sensors are the prime enablers for managing the expanded battlespace […]. Gaps between brigades become acceptable when electronic sensors provide a robust picture of the battlespace."[124] Dispersed warfare has further advantages. They are mostly connected with the passive defense against the enemy indirect weapons systems. Highly dispersed troops are less vulnerable to air assets and precision fires. Most of all however they are not presenting a lucrative target for use of weapons of mass destruction. The fire support battlefield operation system (BOS) enjoys significant advantages thanks to the digitized C4I. Since every vehicle is equipped with the field internet interface, all levels of command can give precise fire acquisition information. Fire support capabilities in case of dynamic, dispersed operations are usually

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[122] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US   Army Research Institute for Behavioral and Social Sciences 2002) p. 41

[123] Nichiporuk, Brian,. *Forecasting The Effects of Army XXI Design Upon Multinational Force Compatibility*, (arroyo center), www.rand.org.publications/DB/DB279/DB279.pdf (Accessed 08.06.2004), p. 9

[124] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US   Army Research Institute for Behavioral and Social Sciences 2002) p. 42

significantly reduced. In case of digitized troops however, precise and fast data transfer enables the artillery commanders to be aware all the times about location of potential targets as well as friendly units. At the same time maneuver units are given detailed, real time information on the artillery targets location. The other BOS's are also gaining the getting advantage of the digitization too. Engineers are able to work more efficiently since they have detailed information on enemy obstacles as well as on the friendly countermobility needs. In the field of logistics the Total Asset Visibility (TAV) system revolutionizes operations. This system, although still under development, is going to be an integral part of the Force XXI C4I concept. The TAV will enable to have constant information about logistic status of all units down to the single vehicle level. Such arrangement will enable the "focused logistics" goal to be fully achieved. In accordance with "Forecasting the Effects of Army XXI Design Upon Multinational Force Compatibility", "TAV is a system that will allow leaner logistics networks to be put in place in the theatre of operations. No longer will US forces pile up 'Iron Mountains' of supplies to make tempting targets for future adversaries."[125]So far however even without the TAV being fully employed the Combat Service Support works much more efficiently. Digitized C4I gives precise information about location of every unit. Such databases create a better ability to link with the elements to be resupplied. The logistic enhancement is well described by the RAND publication, using the example of the casualty evacuation they state that, "digital tools have enhanced casualty evacuation procedure on several accounts. The unit can send precise location of casualties. The medic knows where evacuation assets and suitable treatment facilities are located."[126] Digitization provides the unit with other, not so well known options. There are many possibilities for ad hoc solutions to the existing problems. During one such occasion, the 4th ID used their "SENTINEL radars to form an ad hoc airspace C2 network reaching 118 kilometers. The

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[125] Nichiporuk, Brian,. *Forecasting The Effects of Army XXI Design Upon Multinational Force Compatibility*, (arroyo center), www.rand.org.publications/DB/DB279/DB279.pdf (Accessed 08.06.2004), p. 10

[126] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US   Army Research Institute for Behavioral and Social Sciences 2002) p. 43

non doctrinal approach worked remarkably well."[127] Finally the Force XXI C4I structure provides a test site for the new digital solutions which are to be employed in the future "Army After Next".

The picture of the digitized force would not be complete without an explanation of its essential disadvantages. First of all, the new C4I structure brings a totally revolutionized command culture. Soldiers trained for traditional warfighting are not necessarily able to adopt to the new environment quickly. As "Managing Force XXI Change" underlines, "the greatest challenge any unit coming to digitization faces is not the TTPs but the culture change that must take place."[128] Within the digitized unit the direct contact between levels of command is reduced to the minimum. The TOC is no longer a place for constructive discussions of leaders. Most of the traditional decision making and troop leading procedures are done either through the field internet or satellite radio contact. Such arrangement speeds up things but on the other hand, "the reduction in face to face interaction […] changes dramatically the social environment for the deployed staff."[129] That means that the digitized capabilities may be fully exploited by potential new generation of warriors, grown up in cyber environment. Such an "overly digitized" approach however creates other possible vulnerabilities, as Colonel Ted Kostich from 4ID underlined; even now "we need to be careful that we don't make our ABC operators technicians instead of warfighters."[130] Excessive reliance on electronic tools can lead to catastrophic decrease in traditional warfighting skills. The decrease one day may reach a level at which the digitization will not be able to compensate for lack of basic knowledge. According to "Managing Force XXI Change", "digitization will not make up for lack of

[127] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US Army Research Institute for Behavioral and Social Sciences 2002) p. 40

[128] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US Army Research Institute for Behavioral and Social Sciences 2002) p. 27

[129] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US Army Research Institute for Behavioral and Social Sciences 2002) p. 30

[130] Kostich Ted, interview 13.03.2001, published in *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US Army Research Institute for Behavioral and Social Sciences 2002)

basic warfighting skills."[131] Finally we have to answer the question "what if all these fancy systems fail to operate?" Such situations may potentially happen in a few scenarios. The adversary may find the way to jam the C4I system; it can be disrupted by extremely bad weather or the electromagnetic pulse of a nuclear explosion. It also can be disrupted by irresponsible people like in a case described by Colonel Bob Cone (4ID), "When some guy at DTAC hit reorganize and all of the sudden in the middle of a fight we begun to drop out of FBCB2."[132] In such cases the back up systems are necessary, some claim that units should conduct traditional map based C2 as a parallel way of command. However David Potts presents a reasonable position that, "once a force has become digitized, traded mass for tempo and become accustomed to information feeds from a whole variety of aerial and stand-off sensors, it will have developed a command tempo and a way of fighting that simply does not lend itself to reverting to chinagraph pencils and paper maps."[133] The same author sees a potential danger of information overload – amount of the information may reach non manageable level. Despite all the digitized tools used in the process, the human (hopefully) will always have to take the final decision. This will never release the obligation from the staff officers to analyze a broad spectrum. Thus according to David Potts, "it is easy to imagine busy staff officers groping their way through a blizzard of such communications from subordinates, superiors and flanking forces. This [overload] is a real issue – of course rigorous information management will help, but the situation will still arise on occasion."[134] To conclude, there are two more important vulnerabilities of the digitized units: expensive electronic tools are difficult to maintain and repair, their change or reprogramming requires civilian contractors. Finally, enhanced C4I system makes a signal battalion a

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[131] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US Army Research Institute for Behavioral and Social Sciences 2002) p. 40

[132] Cone Bob, interview 02.03.2001, published in *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division* (US Army Research Institute for Behavioral and Social Sciences 2002)

[133] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 200

[134] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 202

vital point of the unit. Destruction or significant reduction of the battalion capabilities may paralyze a whole operation. Following the "Managing Force XXI Change", "the signal battalion has become the Achilles' heel of the digital operations."[135]

In sum, the digitization of currently operating units maximizes their combat power. Efficient distribution of assets, undisturbed flow of information, easy intelligence sharing and fast decision making are all upgrading the standards of warfighting to the levels unknown before. All of these advantages however can cause a lot of negative effects if not employed carefully. Nevertheless, the aforementioned disadvantages can produce disastrous effects for even the most efficient force. For the time being, the operations run by 4 ID show a positive development. The division scored an operational success during Operation Iraqi Freedom. This can be the proof that the US Army approaches digitization with the necessary prudence. The performance of the future generation warriors will finally verify the relevance of new C2 concepts.

C.   ARMY AFTER NEXT

The Army After Next (AAN) project represents the third stage of the US Army transformation. It is a highly futuristic concept, which is to be constructed based on the operational experience gained from the SBCT's and the Force XXI units. According to Major General Robert H. Scales, Jr. "the chief of staff of the Army and the commander, Training and Doctrine Command established the Army After Next project in February 1996 to help the Army leadership craft the vision of future Army requirements. The project connects the process of change represented by Army XXI and guides future Army research and development."[136] One of the most important characteristics of the AAN

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[135] Leibrecht, Bruce, C., Johnston, John, C., Black, Barbara, A., Quinker, Kathleen, A., *Managing Force XXI Change: Insight's and Lessons Learned in the First Army's Digital Division*, (US   Army Research Institute for Behavioral and Social Sciences 2002) p. 40

[136] Scales, Robert, H., *Future Warfare Anthology*, (US Army War College, 2000) p. 126

study is that "it is a journey, not a destination. Thus, it is a process that is envisioned less to resolve a specific problem than to produce a set of potential solutions for a range of evolving future challenges."[137]

The program is focused on analysis of the current troops' performance, future threat assessment, and a new weapon systems design paired with innovatory tactics. Following one of the TRADOC documents, the mission of the AAN study is to, "conduct broad studies of warfare to about 2025, frame issues vital to the development of the US Army after about 2010 and provide issues to senior Army leadership in a format suitable for integration into TRADOC combat developments programs."[138] Working groups of the AAN program are going beyond the Army Vision 2010 scope. Their thinking is focused on the creation of a force composed of not yet existing combat systems. Such a study requires a highly visionary approach and sophisticated simulation techniques. In order to fully understand the value of AAN one must remember that, "a key point to note is that even though the studies focus on the time period of the far-future Army, they articulate the need to leverage these studies earlier so that they can be integrated into development programs."[139]

The whole study process is divided into several areas, "the geostrategic setting, the evolution of military art, human and organizational issues, and technology trends."[140] Analysis of future developments in these fields is to provide the Army with concise vision of the nature of warfare in 2025. The purpose of such a concise, visionary approach is to make sure that the transition of Land Forces will go in the right direction at the right pace. In other words, "AAN's four broad areas of study all seek to clarify developments in geopolitics, military art, human and organizational issues, and technology that are today only dimly perceived, and then integrate those insights with

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[137] Matsumura, John, Steeb, Randall, Herbert, Thomas, Eisenhard, Scott, Gordon, John, Lees, Mark, Halverson, Gail, *The Army After Next Exploring New Concepts and Technologies for the Light Battle Force*, (RAND, 1999) p. v

[138] TRADOC, *Knowledge and Speed: The Battle Force and the Army of 2025* p. 1

[139] Matsumura, John, Steeb, Randall, Herbert, Thomas, Eisenhard, Scott, Gordon, John, Lees, Mark, Halverson, Gail, *The Army After Next Exploring New Concepts and Technologies for the Light Battle Force*, (RAND, 1999) p. 3

[140] Scales, Robert, H., *Future Warfare Anthology*, (US Army War College, 2000), p. 126

those of other services into a cohesive joint view of future warfare."[141] The analysis itself is organized on "three main features: studies, wargames, and analysis."[142] The three forms of the process are functionally connected with the wargame as a central part. The working cycle is best described by the publication, "Issues Raised During AAN Wargame": "Studies were conducted by TRADOC or other agencies to examine operational concepts and/or technologies. The annual wargames were the highlight of the year's effort. Following the wargames, an analysis was conducted to examine various issues that surfaced during the games or pregame studies."[143] The wargame, as a central, annual element of the study gives the most interesting conclusions. In order to present the essence of the future AAN visions some of these conclusions will be discussed below.

First of all, the AAN is seen as a component of the army being mostly composed of Force XXI type units. Only a small part of the Land Forces will be reconfigured along futuristic lines. These units however will perform the role of spearhead, a global response force being capable of rapid deployment anywhere in the world. Following one of the RAND publications, "the AAN is foreseen as a small part of the Army, comprising elite battle forces subdivided into battle units. These will be the US Army spearhead: units capable of rapid deployment, short-term sustainability, and entirely new methods of combat, with Army XXI units forming the more conventional follow-on force."[144] In other words, "organizationally, the Army After Next Project anticipates a hybrid U.S. Army combining very advanced components with "legacy" forces. This will include: contingency forces including Battle Forces, Strike Forces, Campaign Forces, Homeland Defense Forces, and Special Forces."[145]

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[141] Scales, Robert, H., *Future Warfare Anthology*, (US Army War College, 2000) p. 136

[142] Walter R. Perry, Bruce R. Pirnie, John V. Gordon IV , *Issues Raised During AAN Wargame,* (RAND), www.rand.org/publications/MR/MR1183/ (Accessed 26.05.2004), p. 3

[143] Walter R. Perry, Bruce R. Pirnie, John V. Gordon IV , *Issues Raised During AAN Wargame,* (RAND), www.rand.org/publications/MR/MR1183/ (Accessed 26.05.2004), p.3

[144] Zaini, Michele, Morison Jennifer, Taw,. *The Army and Multinational Force Compatibility,* www.rand.org/publications/MR/MR1154/ (Accessed 06.06.2004), p. 1

[145] *"Second Annual Report of the Army After Next Project"*, Fort Monroe, VA: Headquarters, United States Army Training and Doctrine Command, December 7, 1998, pp. 11-13.

The essence of the AAN's strength will be defined by speed, exercised in "strategic, operational, and tactical dimensions."[146] According to the most current projects, "the AAN-era force (focused on year 2025) will contain a Force XXI component and will also include a potential component with greater force flexibility and lethality."[147]

The AAN's capability will be mostly ensured by the high lethality, protection, mobility, self sustainability and the state of art C4I. Operations of AAN components will be highly integrated with the Force XXI units. The AAN will either defeat potential enemies by itself or it will provide conditions for the deployment of the Force XXI components. First of the problems foreseen in such a scheme by AAN's analytics is a challenge "to ensure a proper fit between the early deploying AAN force and the slower deploying Army XXI forces. While the former must arrive quickly to collapse the enemy, the latter must posses enough strategic agility to follow immediately behind to guarantee unrelenting long-term pressure on the enemy and to limit risk to the early arriving force."[148]

Once in theatre, the forces of 2025 will conduct in much the same way of current operations. In his publication "The Future of Infantry: Maneuver in the XXI Century", Billy E. Wells claims that infantry will compose the main part of the AAN's maneuver forces. His thesis is that "highly mobile infantry combined with increasingly lethal artillery and aviation will be dominant land combat force of the future."[149] Although the nature of the infantry warfare will change due to strengthening marriage with indirect fire and aviation, the basic role of the foot soldier will remain the same. According to the same author, "the basic combat mission of the infantry is unlikely to change in the long term. Infantry will continue to close with the enemy by means of fire and maneuver to

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[146] Scales, Robert, H., *Future Warfare Anthology*, (US Army War College, 2000) p. 157

[147] Matsumura, John, Steeb, Randall, Herbert, Thomas, Eisenhard, Scott, Gordon, John, Lees, Mark, Halverson, Gail*, The Army After Next Exploring New Concepts and Technologies for the Light Battle Force*, (RAND, 1999) p. 5

[148] Scales, Robert, H., *Future Warfare Anthology*, (US Army War College, 2000) p. 152

[149] Wells, Billy, E., *The Future of Infantry: Maneuver in the XXI Century*, (US Army War College Strategic Research Report, 1997), p. 1

defeat or capture him, or to repel his assault by fire, close combat, and counterattack."[150] On the other hand structures of combat infantry units may significantly change. Current research for example is focused on units constructed "according to the rule of sixes: six battle units in battle force, six battle elements in a battle unit, and six battle squads in a battle element."[151]

Despite the unchanged role on the battlefield, some analysts claim that the infantryman will shift from being a direct fire warrior to an indirect fire caller. In accordance to David Potts, "the future infantryman will become much more of a sensor or a caller for effect than the deliverer of firepower through crew served or hand held direct fire weapons."[152] Study of the current development trends in a small arms technology shows a few other aspects which may change the nature of warfare. Fire fights in 2025 may take place at extended distances. "While close combat is the essential infantry task, weapons developments clearly indicate that in certain conditions infantry will fight at extended ranges."[153] Such a trend indicates that "to close up" with the enemy may have a different meaning in two decades time. Weapons technology will be further enhanced by advanced digitization and night fight capability. The combat power of a single trooper will be highly increased by implementation of such systems like 'Land Warrior'. This system, as described by Barbara A. Jezior, will most likely be composed of a "helmet mounted display, an improved image intensification, modular weapon, improved protective clothing to include improved modular body armor, a computer and radio set-up, and special software for battlefield communications."[154] Such

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[150] Wells, Billy, E., *The Future of Infantry: Maneuver in the XXI Century*, (US Army War College Strategic Research Report, 1997), p. 2

[151] Matsumura, John, Steeb, Randall, Herbert, Thomas, Eisenhard, Scott, Gordon, John, Lees, Mark, Halverson, Gail*, The Army After Next Exploring New Concepts and Technologies for the Light Battle Force*, (RAND, 1999) p. 12

[152] Potts, David, The *Big Issue: Command and Combat in the Information Age*, (Strategic And Combat Studies Institute, 2002) p. 22

[153] Wells, Billy, E., *The Future of Infantry: Maneuver in the XXI Century*, (US Army War College Strategic Research Report, 1997), p. 3

[154] Jezior, Barbara, A., *The Revolutionized Warfighter Circa 2025*, article in "AY98 Compendium, Army After Next Project", edited by Johnson II, Douglas, V., (1998), www.carlisle.army.mil/ssi/pdffiles/PUB261.pdf , (Accessed 09.04.2004), p. 42

enhancements are no longer a vision or a fantasy, since they are the subject current projects. Barbara A. Jezior names few of them:

- "Force XXI Land Warrior (individual communication, situational awareness, body armor)",

- "Small Unit Operations (communications, geo-location, situational awareness, sensor to shooter linkages)",

- "Objective individual Combat Weapons (precision individual weapons)",

- "Combat Identification (friend or foe system)",

- "Counter Sniper",

- "Non- Lethal Weapons",

- "Multi Purpose Individual Munition (AT shoulder fired weapon)"[155]

Lethality and survivability of the infantry will be further increased by the introduction of a new anti tank capabilities. The AAN's squads will likely be issued current advanced systems or their upgrades. With the introduction of the latest, new generation's AT weapons, the US Army increased significantly the effectiveness of its infantry. According to Billy E. Wells, "four air transportable systems, Javelin, Follow on to TOW (FOTT), Line of Sight Anti Tank (LOSAT), and the Enhanced Fiber Optic Guided Missile (EFOGM), are dramatically changing the open field advantage in favor of the easily concealed and increasingly lethal infantryman."[156] These systems are foreseen to remain in service with the AAN.

The range of the squad's response options will enlarge widely with the introduction of non lethal weapons. Such tools will become especially useful in peace keeping operations or in heavily populated areas. Billy E. Wells describes these devices as " microwave sound weapons […]. In the non lethal mode, these weapons create

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155 Jezior, Barbara, A., *The Revolutionized Warfighter Circa 2025*, article in "AY98 Compendium, Army After Next Project", edited by Johnson II, Douglas, V., (1998), www.carlisle.army.mil/ssi/pdffiles/PUB261.pdf , (Accessed 09.04.2004), p. 44

156 Wells, Billy, E., *The Future of Infantry: Maneuver in the XXI Century*, (US Army War College Strategic Research Report, 1997), p. 5

imbalance and disorientation through effects of the inner ear and can incapacitate individuals. But with sufficient power, they can cause the internal organs to resonate, producing death."[157]

The strength and agility of the infantry squad will be further increased by introduction of the new armored infantry carrier's family. The Bradley vehicle is planned to stay in service until the year of 2020, when it is going to replaced by the Future Infantry Vehicle (FIV). The requirements for the FIV design were forwarded by the Directorate of Combat Developments. The document "Mission Need Statement for FIV" gives the following criteria: "designed for greater mobility, the FIV will weigh no more than 25 tones, be transportable by C130 or airdropped from C17 or C5, capable of high dash speeds and rapid acceleration, the vehicle would employ advanced propulsion systems (possibly an electric drive) and be fuel efficient relative to current systems.[…] Addressing a critical mobility shortfall in the current Bradley, the FIV will be amphibious capable within 5 minutes preparation."[158] In the same document authors list some unique, high tech capabilities of the FIV such as "autopilot […], along with robotic control by the dismounted squad."[159] Mobility and lethality of the future infantry will be additionally enhanced by thorough integration with army aviation. The new vehicles are to be capable of being carried by helicopters. Such arrangement will remove the terrain restrictions on the maneuver of combat units. Integration of the infantry at the lowest levels of command with aviation is seen as an inevitable process. According to journalist Sean D. Naylor today's "innovative tactics such as ferrying light anti armor teams around the battlefield in UH60 Blackhawk helicopters to block OPFOR movement provide a clear indication of the future capabilities of infantry married to aviation."[160] Nothing indicates however that the further integration of infantry and aviation will preclude the

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[157] Wells, Billy, E., *The Future of Infantry: Maneuver in the XXI Century*, (US Army War College Strategic Research Report, 1997), p. 8

[158] Directorate of Combat Developments, *Mission Need Statement for Future Infantry Vehicle (FIV)*, November 30, 1995, p. 8

[159] Directorate of Combat Developments, *Mission Need Statement for Future Infantry Vehicle (FIV)*, November 30, 1995, p. 8

[160] Naylor, Sean, D., *The Javelin Missile: A Lethal Ace Up The Sleeve*, Army Times, April 28, 1997, p. 14

use of armor. The future of tanks is however determined strictly by the technology development. Electromagnetic guns, hybrid or electric propulsion and advanced armor are all have a purpose of reduction of weight and logistic tail.

Nothing however will improve without the drastic transition in the logistic sphere. The statement of Gary J. Mostek, "without a revolution in military logistics, there will be no revolution in military affairs or AAN" seems very likely to be true.[161] Revolutionary approaches in logistics are represented by three most important trends. First of all – the CSS planning has to enter the era of digitization. So far the Total Asset Visibility (TAV) system failed to be timely fielded in the Force XXI units. The AAN however is designed to have such system as an integral part of the whole C4I. Joint version of the TAV, in accordance with Yves J. Fontaine, "is to be a responsive, user friendly system, easily understood by all and capable of rapid deployment to contingency areas."[162] The system will assure focused, timely CSS to combat units. It will also enable to get rid of "iron mountains" being such a painful problem during the latest US Army expeditionary missions. Secondly the logistic troops will most likely go through a high specialization. Such specialized components will be that further task organized into functional modules. The same author stresses that, "we need a CSS force based on a modular system. We must build logistics modules tailored to perform specific functions."[163] Thirdly, the revolution in military logistics requires a change in maneuver forces themselves. Following the current trend, "the US Army must undergo a deeper technological revolution and develop radically new systems, such as tanks that do not use conventional

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[161] Mostek, Gary, A., *Logistic Support To The Army After Next Warfighters: A Time For Fundamental Change*, article in "AY98 Compendium, Army After Next Project", edited by Johnson II, Douglas, V., (1998), www.carlisle.army.mil/ssi/pdffiles/PUB261.pdf , (Accessed 09.04.2004), p. 95

[162] Fontaine, Yves, J., *Strategic Logistics For Intervention Forces*, article in "AY98 Compendium, Army After Next Project", edited by Johnson II, Douglas, V., (1998), www.carlisle.army.mil/ssi/pdffiles/PUB261.pdf , (Accessed 19.04.2004), p. 87

[163] Fontaine, Yves, J., *Strategic Logistics For Intervention Forces*, article in "AY98 Compendium, Army After Next Project", edited by Johnson II, Douglas, V., (1998), www.carlisle.army.mil/ssi/pdffiles/PUB261.pdf , (Accessed 19.04.2004),, p. 86

fuels and ammunition. In other words, the US Army must develop systems that require very little or no logistic tail."[164]

Concluding the analysis of potential developments in the AAN's units one has to say that their capability, significantly increased by new technologies, will represent a step ahead of the scale not known before. Units, operating most likely in regimental size structures, will enjoy battlefield awareness, superb C4I systems, accurate, constant, real time intelligence, precise fire support and focused logistics. These characteristics in conjunction with increased lethality, protection and mobility of new weapon systems will create totally new operational standards. Among the areas researched, the most important are "information dominance and predictive planning, rapid and very light deployment, creation of virtual ambushes (massed, quick-strike precision fires at a time when an enemy is vulnerable and not expecting an attack, which is planned and executed with information supremacy), and coordination of a variety of different standoff weapons."[165] The AAN project has the purpose to make sure that these standards are high enough to address the potential threats and that once they are set, they can be reached within realistic timeline. Such complex solutions of army transition should be closely observed not only by the potential US adversaries, but most of all by their potential and current allies. The transitory process should go, if not in the same pace, than at least in the same direction. Within the next two Chapters I will discuss whether the Polish Army, with its strengths and weaknesses can maintain a major course of the military reforms set by their forerunner, the US Army.

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[164] Fontaine, Yves, J., *Strategic Logistics For Intervention Forces*, article in "AY98 Compendium, Army After Next Project", edited by Johnson II, Douglas, V., (1998), www.carlisle.army.mil/ssi/pdffiles/PUB261.pdf , (Accessed 19.04.2004), p. 89

[165] Matsumura, John, Steeb, Randall, Herbert, Thomas, Eisenhard, Scott, Gordon, John, Lees, Mark, Halverson, Gail*, The Army After Next Exploring New Concepts and Technologies for the Light Battle Force*, (RAND, 1999) p. 14

III. POLISH LAND FORCES OF TODAY

Poland, throughout the last twenty years has gone through radical political reforms. To begin, security environment characteristics and the directions of defense policy turned literally 180 degrees. Also the collapse of the USSR, destruction of the Soviet Block, disintegration of the Warsaw Pact and internal political changes impacted Armed Forces in virtually all aspects. Starting from the early eighties, the country has been steadily falling into a major economic crisis. The first budget restrictions touched the military in 1988. Substantial cuts in financial resources stimulated the first of a series of radical changes. In 1989, according to Andrzej Karkoszka, "sixty eight military units were disbanded, reducing strength by about thirty three thousand soldiers, and some four hundred old tanks."[166] These changes of course did not have "revolutionary" or "reformatory" character although, for the military it was the first sign that they would have to adapt to the new environment. The Polish Army, in 1989, still represented a gigantic structure being rated as the second largest force in the Warsaw Pact. The remaining number of 421.000 troops, 2800 tanks, 2400 APCs, 2300 guns and 500 aircraft was too excessive for the capabilities of the shrinking budget. Economic constraints resulted in a slowly growing disintegration process in all spheres of the Armed Forces. The number of exercises was reduced, maintenance problems required cannibalization of older vehicles, new equipment purchases were limited to almost none and living conditions of troops drastically deteriorated.

At the same time the country was going through an internal and external political evolution which resulted in serious challenges for national security. Reunification of Germany and dissolution of the Warsaw Pact in 1991 caused various security dilemmas. "With the unification of Germany Poland saw NATO move to its eastern border. Than with the 14 November 1990 Polish German border treaty, Poland no longer viewed

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[166] Gyarmati, Istvan, Winkler, Theodor., *Post Cold War Defense Reform*, *Lessons Learned in US and Europe*, (Brassey's, 2002), article written by Andrzej Karkoszka, p. 165

Germany as a threat."[167] The situation behind the eastern border of Poland was unstable for a long time. According to Jeffrey Simon, "Poland viewed the Soviet Union and then the USSR's successor Russia, as a risk for its instability."[168] At the same time, important changes took place in the domestic politics sphere. On 27 January 1990, the Polish United Workers Party was dissolved. The first free elections were organized on 27 October 1991. Shortly after, Lech Wałęsa was elected as president. As a head of state, "he sought the powers to appoint a commander in chief of the Armed Forces in times of war and to deploy Poland's Armed Forces not just during periods characterized by a foreign threat."[169]

A.   DEFENSE REFORMS OF THE LAST DECADE OF THE XX CENTURY

The country could not be changed without parallel reforms for the Armed Forces. Thus, as Karkoszka describes it, during the first stage of military reform, "the Armed Forces were to be freed from the tutelage of the communist's party, fully renationalized in form and substance, and brought under control of the democratic authorities of the state."[170] It was an arduous task: the military establishment, grown in the realities of the communist state, was used to being involved in political affairs. High ranking officers strongly believed that their share in domestic politics was their right. Moreover the Armed Forces, not without reason, claimed their merit in the democratization process. The Martial Law of 1981 was seen by many as a defensive act against the Warsaw Pact intervention. General Jaruzelski, head of the military, was also described as a person who allowed the system to change. This way of thinking caused a serious obstacle in the process of democratic control for the Army - especially since many high ranking officers considered themselves a special class of national leaders rather than mere soldiers.

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[167] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 5

[168] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 5

[169] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 12

[170] Gyarmati, Istvan, Winkler, Theodor., *Post Cold War Defense Reform*, *Lessons Learned in US and Europe*, (Brassey's, 2002), article written by Andrzej Karkoszka, p. 168

Difficult reforms were initiated in January 1991 by dissolving the Party cells inside military units. Consequently, all political officers were either expelled or retrained and given other functions (the latter solution has caused problems in the Amy till this day). At the same time, the infamous Feliks Dzierżyński's Military Political Academy was dissolved. Among other changes were: freedom of religion and the reinstatement of the Armed Forces chaplains after a 50 year ban. Uniforms and regulations were restored from the pre World War II period. Implementation of civilian control over the military was also going on in a parallel way. In the mid 1990's, the first civilian vice ministers of defense were introduced. Further changes in the civil military sphere were to be projected by the Żabinski commission, established in 1990. The institution consisted of four teams with various tasks: "to transform the MOD into a civilian body of state administration, to restructure the armed forces, to rationalize the defense industry and to establish parliamentary oversight organizations."[171] As a result of its work, the Bureau of National Security was put into effect. This body, run by civilians, was primarily to be an advisory organization for the President. At the same time, the old post communist Committee of Defense of the Country was still operational. In November 1992, it formulated two documents: "The basic premises of the Polish security policy" and "The security policy and defense strategy of the Polish Republic". These two strategies recognized a relaxation in relations between Poland and NATO countries – in particular Germany. They also mentioned Polish European Union membership aspirations. Furthermore, the documents outlined the possibility to join NATO structures. "The security policy and defense strategy of the Polish Republic" burdened the Armed Forces with a challenging and almost impossible task. The concept of the so called "defense on all the azimuths"[172] assumed local conflict as a main threat. The term, local, in a global perspective however meant, "full scale" from the Polish point of view. Main efforts were not specified, therefore, the situation required equal deployment of forces along the borders' perimeter. Neither the budget nor the actual strength of Armed Forces allowed

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[171] Warsaw TVP Television, 25 February 1991. FBIS-EEU-91-038 (26 February 1991): 27

[172] Gyarmati, Istvan, Winkler, Theodor., *Post Cold War Defense Reform*, *Lessons Learned in US and Europe*, (Brassey's, 2002), article written by Andrzej Karkoszka, p.170

accomplishing such a mission. As Karkoszka underlines, the military "was confronted with an increasingly shrinking defense budget, by 35% in years 1989-91 and down to 50% during the next two years."[173] At the same time, a "top heavy" military did not allow for reductions in central administration structures. As a result of the economic crisis, the Army was only able to deploy three brigades in the east until 1993. Difficult situations resulted in frustrations for both the military and the civilian authorities. Generals were not satisfied with the performance of newly appointed personnel of the MOD. In fact, Poland suffered at that time from a lack of a professional civilian administration. At the same time, political authorities were upset about the slow pace of the reforms and the opportunism of the military to any change. As a result the gap between the civilian sphere and the soldiers started to widen. Civilian authorities struggled for influence over the military. In January 1992, the director of National Security Bureau, Jerzy Milewski, insisted that the president should have "greater authority at the army command level … during peacetime."[174] Further separation of civil and military affairs was continued by new Ministry of Defense – Onyszkiewicz. On 22 October 1992 he "signed an order that restricted his activities to political management of the MOD and put the General Staff in charge of strictly military matters."[175] Despite these trends, in some cases "the civil – military gap" became to be dangerously thin; top military leaders got involved in the political campaign of 1993, which was quickly picked up by the media. Finally in March 1993 the restructuring of the higher command levels was over – Minister Onyszkiewicz reported to the parliament that now it is the time to start talking about "adjusting the structure of troops deployment to new strategic concepts."[176] These uncomfortable circumstances Poland encountered, were called by Karkoszka "the second stage of defense reforms". In sum, according to Jeffrey Simson, "between 1988 and 1993 Poland's democratic reforms of the military was marked by

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[173] Gyarmati, Istvan, Winkler, Theodor., *Post Cold War Defense Reform, Lessons Learned in US and Europe*, (Brassey's, 2002), article written by Andrzej Karkoszka, p. 170

[174] Milewski interview , p. 2 JPRS-EER-92-023 (2 March 1992): 11

[175] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 20

[176] Warsaw PAP, 26 March 1993, FBIS-EEU-93-059 (30 March 1993): 20

governmental instability and constitutional and defense/ legal ambiguities in the face of a self confident military long accustomed to civilian incompetence."[177]

Within the period between 1994 and 1996, the accession to NATO was clearly defined as a strategic goal and was widely supported by all political parties and by public opinion. Starting from 2 February 1994, Poland became an active participant of the Partnership for Peace (PfP) program. Official requests for NATO membership was forwarded on 25 April the same year. New Ministry of Defense Kolodziejczyk stressed that Poland "must strive to achieve that goal because there is no alternative."[178] Consequently, numerous Polish officers were sent for training in NATO training facilities. Certain military units became frequently engaged in Partnership for Peace (PfP) exercises. In 1994, "100 billion zlotys were allocated for PfP, the Sejm Defense Commitee added 500 billion more for implementing the program."[179] The first of such events took place in Poland on June 1994, when reduced financial resources were concentrated on a few units, making them a spearhead of interoperability. The 6th Airborne Brigade, the 6th and the 10th Armor Brigades and the Special Forces unit GROM became the best equipped and trained troops. In fact, the first of the higher mentioned units was responsible for the Polish SFOR contingent which initiated wide participation in foreign military interventionism.

Despite the fact that some positive changes took place at the operational level, some negative tendencies still existed among the General Staff ranks. Isolationism, politicization and frustrations of the highest military structures reached the top during the so called "Drawsko Affair". Amidst the meeting of generals with the President and civilian MOD personnel the discussion almost evolved into a revolt resulting in a vote of non confidence which was directed to the Minister of Defense. When the question, "Should the Minister be dismissed?" was asked, "all generals' hands except two went

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[177] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 25

[178] Warsaw, Polska Zbrojna, 2 September 1993, p. 2

[179] Finance Minister Grzegorz Kolodko, interview, Warsaw Polska Zbrojna, 25-27 November 1994, pp. 1-2. FBIS-EEU-94-232 (2 December 1994): 17-18

up."[180] As Simon describes it, "at Drawsko the Army officials appropriated the powers of parliament when they voted to recall the minister."[181] The affair and the whole tension between civil and military authorities were quickly discovered by NATO decision makers. The Alliance described the lack of effective civilian control as the main obstacle in accession of Poland to NATO. Being aware of that perception, the Polish Parliament initiated a dynamic debate on defense issues. This declaration was finally signed on 16 February 1995. The document stated flatly the necessity of Western type civilian control over the Armed Forces. It also promised a budget's increase. Along with that declaration, the basis for the first comprehensive defense reform was set. In December 1995, the Parliament voted for the bill establishing the function of the civilian minister of defense. According to Article 2 of the bill, the main tasks of the Minister were:

- "management in time of peace of all aspects of functioning of the armed forces
- preparation of premises for defense of the country, including proposals on the development and structures of the armed forces
- implementation of general guidelines and decisions of the Council of Ministers, dealing with defense issues
- controlling all administrative end economic institutions of state in defense related tasks
- management of defense personnel reserves
- management of armed forces personnel
- management of the whole realm of defense."[182]

These changes finally reduced the role of the General Staff - it lost control over finances and promotion system. It also lost monopoly for supervision and control over the Armed Forces. General Staff officers finally agreed to the overall trend of reforms. It was

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[180] Warsaw TV Polonia Network, 11 Octeber 1994. FBIS-EEU-94-197 (12 October 1994): Warsaw Życie Warszawy, 12 October 1994, p. 2. FBIS-EEU-94-198 (13 October 1994): 17

[181] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 37

[182] Gyarmati, Istvan, Winkler, Theodor., *Post Cold War Defense Reform*, *Lessons Learned in US and Europe*, (Brassey's, 2002), article written by Andrzej Karkoszka, p.176

best expressed in words of gen. Wielecki who said that, "Despite what some people say, the possibilities of ordering the system of managing the country's defense and commanding the armed forces, as created by this law, are quite considerable and generally positive."[183] The year of 1996 brought reforms of other levels of command when each service created its own command (Land, Air and Naval Command). The Services' Commands were directly subordinated to the defense minister, what further undercut the role of the General Staff.[184] As the next step, the divisions were reconfigured from old regimental to the NATO standard brigade system.

The first structural innovations initiated the third period of Polish defense reform. Within the next few years, Poland intensified her efforts to integrate with NATO. Aspirations were met with a positive attitude from the North Atlantic Council and were expressed in December 1996 in the form of a promise to invite one or more states to the Alliance during the NATO summit in July 1997. Along with promises at the political level, Polish Forces were continuing reforms at the operational sphere. In 1996 the 11th Armor Cavalry Division, the 6th Airborne Brigade, the Air Cavalry Regiment, two rescue ships and the Naval SAR group were declared to be ready for joint operations. A great deal of investment was focused on the air defense system. The newly built Air Sovereignty Operations Center enabled digital information exchanges within the NATO Air Defense System. The year of 1997 also brought solid legal developments – on 2 April 1997 the National Assembly approved new Constitution. Its Article 134.3 "gave the president power to appoint the chief of the General Staff and the commanders of services."[185] Another important statement of the Constitution underlined that "the Armed Forces adhere to neutrality on political affairs and are subject to civilian and democratic control."[186]

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[183] Wilecki, Tadeusz, General, former Chief of Staff, Polish Armed Forces, interview for newspaper *Rzeczpospolita*, (Warsaw, 14 August 1996).

[184] "Organizational Regulation For Managing Defense Ministry", signed by Defense Minister Dobrzanski, 20 November 1996, Annex No. 2

[185] Constitution of Polish Republic, approved 2 April 1997, Article 134.3

[186] Constitution of Polish Republic, approved 2 April 1997, Article 26.2

The technological and the structural upgrades though were made at the cost of other needs. Specifically, standards in the social sphere of military life significantly decreased. Salaries, although still not catastrophically low, were not high enough to attract young people to professional service. Officers' Schools lost their popularity and numerous well trained, ambitious young people left the service for better pay in civilian enterprises. Growing unemployment hit military families, making an especially difficult rotation from one garrison to another. Military housing quality dropped in comparison with rising overall standards. Medical care's standard decreased as a result of badly planned reforms and a lack of finances. As a result, the morale of the Army in the mid nineties dropped significantly and what's the worst – this effect was most relevant among junior officers and NCOs.

The year of 1996 showed "a light in the tunnel". Following Karkoszka, "for the first time since 1989 the defense budget increased in real terms reaching about 2.3 % of the Gross Domestic Product (GDP)."[187] Salaries increased and the social services quality looked to be improving. The most significant event occurred during that period, when for the first time the Polish Parliament debated and voted for a comprehensive, long term plan for Armed Forces development. The Parliament's assumption was that peace time personnel strength would be kept to around 160,000- with 50% of the Armed Forces holding professional positions. The structure of the budget was to be changed in favor of the new equipment purchase. Many of the central administration structures (including two Military Districts) were disbanded. However the so called "Plan 2012" was quickly cancelled for two reasons: firstly, the assumption that the GDP growth would not drop below 4.2% level was wrong; secondly, the NATO Summit in Madrid resulted in several "Force Goals" which were not earlier taken into consideration. Gen. Szumski in his speech to the Sejm Defense Committee mentioned that, "the budget was inadequate to meet the needs of the Army 2012 program", he further stated that "the army needed 84

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[187] Gyarmati, Istvan, Winkler, Theodor., *Post Cold War Defense Reform, Lessons Learned in US and Europe*, (Brassey's, 2002), article written by Andrzej Karkoszka, p. 181

million zlotys more than allocated."[188] Finally, the Parliamentary Elections in 1997 significantly changed the political environment of the defense reforms.

These new circumstances marked the beginning of the fourth stage of the defense reforms - according to Karkoszka. A new Armed Forces Development Plan was forwarded. It assumed robust reforms in the personnel sphere of the military. This socially painful process was eased by the conversion program for released soldiers. The so called "Army 2006" plan focused on the realization of sixty five "Force Goals" formulated by NATO. The plan defined new personnel strength ceilings at levels: 180,000 in 2001, 165,000 in 2002 and 150,000 in 2003.[189] Another goal of the reform was "to increase the 10% of the budget allocated for modernization in 2000 to 23% in 2006."[190]Operational forces were to be augmented by territorial troops of six to eight brigades' strength. Within technical field, the priority was given to modernization of air defense systems, combat helicopters, tanks, armored personnel carriers (APCs), anti- tank and anti- ship missiles. New fighter aircraft purchase were also planned; although, it was to be financed from sources outside the MOD budget. The reforms of the fourth phase culminated when "Poland achieved NATO accession in March 1999, which marked its movement full circle from Warsaw Pact member in 1989."[191] In 2001, on the 24th of January, the President of Poland signed a new strategic concept. This document emphasized again, local conflict as a main threat to the country's integrity. The concept was classified and it was constructed along with overall NATO tendencies. These assumptions were valid until the year of 2003 when the President signed a new, updated security strategy. This document is described in detail in subchapter 3.2.

In summation, with the beginning of the new millennium military affairs were put on, what Karkoszka calls, "a right track". The reform program made steady progress – its

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[188] Szumski, Henryk, General, former Chief of Polish General Staff, speech to the Parliamentary Defense Committee on December1997.

[189] Gyarmati, Istvan, Winkler, Theodor., *Post Cold War Defense Reform*, *Lessons Learned in US and Europe*, (Brassey's, 2002), article written by Andrzej Karkoszka, p. 184

[190] Sejm Defense Commision Chairman Stanislaw Glowacki, interview, Warsaw Tygodnik Solidarnosc, 9 March 2001, p. 3

[191] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 5

achievements are presented in the subchapter below. The most important improvement however, was that Poland, through the last decade, finally achieved three strategic goals, which changed the course established by our allies during the Yalta Conference:

- it broke all military ties with old Soviet block (including withdrawal of Soviet troops from Poland)

- it depoliticized and renationalized the Armed Forces (including bringing civilian control)

- it became an active and full right NATO member.

B.   PRESENT STRUCTURE AND CAPABILITIES

Terrorism has various roots that cannot be identified with one nation or religion, but our duty is to fight and do everything to be more secure together[192]

Polish Armed Forces have been under constant reform since the Soviet bloc collapsed. Dynamic changes in the strategic environment required a great deal of agility and a flexible approach to structural problems. Land Forces, in particular, experienced the effects of not always wise reforms. The unstable situation in the East – communist coup in Russia, regime rule in Byelorussia and unpredictable behavior of Ukrainian leaders did not allow Poland to relax once the Cold War looked to be over. Withdrawal of Russian troops from the former Democratic Republic of Germany also produced a tremendous amount of tension. For example, the Soviet withdrawal from Austria in 1956 through Hungary gave Polish elites much to think about. NATO membership aspirations also brought requirements for the Armed Forces. The year 1999 gave us a member status, but the society learned quickly that to be in the pact did not mean that its eastern border was protected by the rest of the allies. In the same year, Polish troops were deployed to Albania and Kosovo. The Polish society at that time presented a mature approach and understanding, expressing 60% support for military solutions in the Balkans which was demonstrated in public opinion polls in 1999.[193] The new security era further pushed

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[192] Speech by Polish President Aleksander Kwasniewski to Polish troops in Lebanon, December 2002

[193] Daalder, Ivo, H., O'Hanlon, Michael, E., *Winning Ugly*, (Brookings Institution Press, 2000), p.101

Poland into the War on Terror. On 22 November 2001, President Kwaśniewski signed the decision sending a Polish contingent to Afghanistan. Two years later, on 6 June 2003 he signed a similar document ordering the deployment of a 2500 man strong force to Iraq. This "new security thinking" was best described in the President's words, "War on Terror must be based on international solidarity. Poland must take part in these activities. […] We know well that allied support and international solidarity in such situations have extraordinary meaning."[194] All the events mentioned above prove that not only historical experience but also the present situation and challenges of the future force Poland to keep effective military power. Within this subchapter, I will describe the actual state of the Polish Land Forces. In order to cover this issue in as much detail as possible, I will first write about their equipment and organization, and secondly I will touch on the sphere of the future perspectives for Land Forces.

Polish Land Forces have been systematically modernized in order to achieve interoperability with its NATO allies. As gen. Cieniuch described it, "the reforms were designed to decrease the weight of Polish troops – NATO requirements pushed military planners to resign from heavy armored units in sake of light, mobile troops."[195]Many significant changes were done in the field of technical equipment. They are all part of "the Armed Forces Modernization Bill" signed by the Parliament in 2001.The plan provided a road map for Armed Forces reform, with the main goal to have one third of land power ready for expeditionary operations within NATO structures by 2008. During the first two years of the modernization program an extensive amount was completed. In order to cover these modernizations completely, I will name equipment upgrades in every battlefield operation system (BOS).

In the case of the "maneuver" BOS, the basic issue was to bring hundreds of thousands of small arms weapons up to NATO standards. Namely, the problem concerned the introduction of a 5.56 caliber assault rifle along with 9mm PARA pistols and submachine guns. The Army introduced a new model of rifle developed on the AK74

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[194] Decision of the President of the Republic of Poland to send troops to Afghanistan signed 11th November 2001

[195] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

construction basis, called the "Beryl", which has a longer barrel, is lighter weight, has optical sight and requires a 5.56 caliber round. The weapon is widely used in Iraq and Afghanistan and it enjoys a good opinion. The change of the assault rifle was especially painful for the Polish defense budget since the Army in the late nineties completed a weapons exchange from 7.62 to the new Soviet 5.45 caliber. Presently these riles are rarely used. Similarly, all pistols and submachine guns were changed to 9mm PARA weapons. Other significant changes took place in armor equipment. The "Modernization Bill" assumed to discontinue all Army's "non perspective" equipment, which included T55 tanks in all versions. Again, the lack of long term planning in previous years wasted a lot of money. During the eighties, many of T55s were upgraded to the "MERIDA" version, which included expensive fire control system and add-on armor. After the reform, the Army was left with T72M, PT91 (T72 with fire control and active armor) and Leopard2A4 (the numbers are shown in APPENDIX C/1). Among these, the Leopard is the most capable. The vehicle was acquired as a part of "25 million euro contract, accompanied by a German offer of twenty three free, NATO interoperable MiG29s."[196] The German made tank belongs to the fourth generation and represents all the most modern trends in armor technology. Equipping our brigades with these vehicles not only increased their combat power but also reduced significant costs of training and maintenance. For example, the 10th Armor Brigade spent 105 million zloty for training and maintenance in each of 2001 and 2002. In 2003, after reconfiguration to Leopard 2 tanks the cost was close to 78 million.[197] The situation does not look as optimistic for the infantry armored vehicles. The Army still drives the BMP1, which is backwards technologically and simply old. In 2003, Polish authorities signed a contract with the Finnish firm Patria and Italian OTO Melara to buy a wheeled Armored Personnel Carrier (APC). The vehicle is going to be built on license in Poland (except the turret) and the first examples are going to be issued in the current year. The APC is equipped with a Bush Master turret and is comparable with the LAV. It is to serve as a frame for the

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[196] Warsaw, Polityka, 28 February 2002 (Internet Version). Warsaw PAP, 28 February 2002

[197] Pietrzyk, Edward, General, Polish Land Forces Commander, *Speech to Parliamentary Defense Commission,* 09th July 2003, published in Defense Parliamentary Commission report 2035/IV, http://orka.sejm.gov.pl/Biuletyn.nsf/

entire family of vehicles in the Polish Army. This concept looks to go along with the US Stryker idea. Forces equipped with new vehicles are to be "designed to operate outside the country's borders."[198] The rest of the Polish BMPs are to be upgraded with a new turret system. Fire power for the Polish infantry will increase since the new anti- armor rocket is going to be issued this year. On 26 July 2002, Polish Deputy Defense Minister "announced that Poland will buy the Israeli Rafael NT-S missile for 1 billion zloty ($246)."[199]

In the sphere of the fire support BOS, things do not look as well. The Polish Army still uses widely self propelled 2S1 (122mm) and DANA (152mm) guns. Their effective range (14 and 17km) does not look impressive in comparison to the 40 km effective range of the German Panzer 2000 or British AS90. There is no talk so far about any precise munitions for currently used tubes. Number of ammunition is also sharply decreasing since most of its producers came from former Soviet Union. In 1998 the army had only 45.558 pieces of 122mm artillery ammunition, which is estimated supply for 4.1 days of war.[200] To overcome the difficulties Polish industry does experiment with the British AS90. On 26 July 1999 "a cooperation agreement was signed between Polish Stalowa Wola steelworks and the British GEC – Marconi to produce 155mm British howitzers on Polish Kalina undercarriages.[201] The idea was to equip a T72 chasse with a British howitzer turret. Few vehicles were constructed and the concept is still in the experimental phase. The still used, multiple launcher rocket system BM21, is obsolete and can be no match to MLRS. I personally took part in the exercise Cellestial Fire in 2001 in Denmark where these two were shooting together side by side. The BM21 has too short an effective range and its reload takes too long. Also, there are no precise attack munitions for this type of launcher. The weak point of the Polish Army is its lack of

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[198] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[199] Andrzej Kublik, "Contracts of the Century", Warsaw Gazeta Wyborcza, 24 May 2002, p. 24,Zbigniew Lentowicz, "Contract Now Signed", Warsaw Rzeczpospolita, 24 August 2002, p. A3. Warsaw PAP, 26 July 2002

[200] Warsaw Gazeta Wyborcza, 31 March 1999, p. 8

[201] Zycie Warszawy, 19 July 1999, p. 2; Warsaw Polskie Radio, 26 July 1999

ability to conduct deep battle. SCUDS and TOCZKA rocket systems cannot be called "precise deep battle assets". As the Deputy of the Chief of Polish General Staff pointed out, "Polish artillery, with its current armament and equipment is not ready for modern battlefield – it lacks precision and range."[202] Fire support from the air is provided by two types of helicopters. The Mi24D Hind looks impressive, but its capabilities on the modern battlefield are not very high. The aircraft lacks the ability to fly at night at low levels. The anti armor armament consists of four wire guided rockets which is out of today's standards. The W3 helicopter is 100% produced in Poland; it is an effective utility helicopter but does not fit into the anti armor role. Its attack version Huzar did not meet "assault helicopter requirements that would come from abroad."[203] Land operations are supported by tactical aviation which uses Su22 jets. Again the aircraft, although capable of carrying a significant amount of ordnance, is obsolete and lacks the ability to fly at low levels. There is no way to compare this aircraft with F15E or Tornado although they have the same mission profile. There was a project of upgrading fifty of these aircraft with Israeli assistance but the plan has not materialized so far.[204] Without improvements, "the life span of these aircraft will qualify for withdrawal in 2004-2006."[205] This situation hopefully will improve starting with the current year when the Polish Air Force will begin receiving F16s as a part of the so called "contract of the century". The decision to by American aircraft was announced on 27 December 2002.[206]

Command and control BOS has gone through very intense reform. Very little can be written about this sphere, since most of the information is classified. However, it is well known that the Polish brigade and higher level HQs are equipped with system "STORCZYK" which enables secure digital communication with allied counterparts.

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[202] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[203] Romuald Szeremietiew, interview, Warsaw Polskie Radio First Program, 13 May 1999

[204] Warsaw, Nasz Dziennik, 29 May 2000, p. 5

[205] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 117

[206] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 135

This ability has been confirmed during numerous exercises. I personally took part in exercise "Crystal Eagle" 2000 when the 12th Mechanized Division was operating in one Corps structure with Danish and German divisions. Communication at levels battalion and below is provided by Thomson made TRC radios with the hoping frequency and data burst capabilities. Current expeditionary tasks however are requiring the most sophisticated C2 equipment of which Polish Army is still short. As Deputy Defense Minister Zemke declared, Polish Army must "very urgently acquire modern satellite communications equipment."[207]

In the field of reconnaissance the Polish Army introduced US made MSTAR ground surveillance radars. Again, specified technical data is classified; however, it is clear that this radar is to replace older Russian made radars (PSNR), which were mounted on the BMP recon version. Poland needs new armored reconnaissance vehicles. Currently used BMPs and BRDMs are relatively old and out of standards in terms of their hardware as well as their overall maneuver capabilities. The recently introduced vehicle ŻBIK, made on BRDM chasse, has more advanced surveillance hardware although its size, thermal signature, maneuverability and survivability are still obsolete. These vehicles are widely used for patrolling purposes in Iraq.

The Polish Army has always enjoyed relatively high standards of engineer capability. Active participation in UN missions in Lebanon, Golan Heights, Cambodia and Bosnia brought a lot of experience especially in minefield clearance. As a result, Polish engineer companies are well equipped and well trained. The current mission in Afghanistan is done almost exclusively by engineers, rotating their personnel on mine clearance duties. The Polish Army also possesses a significant number of relatively good standard river crossing equipment – special bridging units are formed at the corps level which is described in more detail further in this subchapter. This ability is a result of specific geographical conditions in Poland.

Many changes have taken place in the field of logistics. The Polish Army had to buy new maintenance vehicles along with new tanks. The Polish made WZT3 maintenance vehicle represents high standards and is widely traded in foreign countries

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[207] Warsaw, Zycie, 13 March 2002, p. 4

using T72 tanks. The Army, in accordance with "Modernization Bill", got rid of a majority of old trucks. The sheer majority of currently used trucks are Polish made. Unfortunately, modernization has not improved combat medical care. The Polish Army does not have dedicated medical evacuation (MEDAVAC) units. Companies lack armor ambulances and helicopter evacuation capability. On the other hand the survivability of a single soldier has been widely improved by the introduction of high standard personal gear. Kevlar helmets and bullet proof vests are current issues. Gore-Tex uniforms and improved boots also increase the field capabilities of individuals. The Polish Army logistic corps is still obsolete in terms of systemic solutions. We do not have and we do not foresee to have systems like Total Asset Visibility. Gen. Cieniuch also underlined during the interview that, "Polish logistics still needs improvement, especially facing current challenges of expeditionary warfare."[208] There is a big hope, though, that sustaining current missions in Afghanistan and Iraq will bring a lot of useful experience in the sphere of logistics.

In conclusion I have to admit that great strides have been made throughout the past ten years. Especially in the last two years, the implementation of the "modernization plan" increased capabilities of the Army. New tanks, the APC contract, F16 purchases, anti armor rockets and small arms improvement are all bringing Land Forces to higher standards. However, as I mentioned above, deep battle capabilities still require a lot of investment. Fire support BOS desperately needs modernization especially because of the recent NATO reforms in this field. Other areas to improve are logistics and reconnaissance. Current state of Polish Army equipment, as gen. Cieniuch mentioned, "allows to be optimistic – new APC, Leopard 2 tanks and new anti armor guided missiles are marking the beginning of important changes, going in good direction."[209]

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[208] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[209] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

With the equipment mentioned above and the manpower of 90,300 personnel[210], Polish Land Forces are organized within two Corpses. Both consist of two divisions, independent brigades and corps' troops. The structure of the 2nd Corps is shown in APPENDIX C/2.

The difference between the 1st and the 2nd Corps is that the latter has one armored and one mechanized division instead of two mechanized divisions. The 2nd Corps also commands three independent brigades:

- 25th Air Assault Brigade,

- 6th Airborne Brigade,

- 9th Mountain Infantry Brigade.

Typical structure of Polish division and brigade is shown in APPENDIX C/3.

The two Corpses create the so called, "operational forces". Multinational troops include Polish – Ukrainian Battalion, Polish Lithuanian Battalion and Polish- Czech – Slovak Brigade which is supposed to be declared as part for European Union military contribution.[211] They are supported by territorial forces whose task is to conduct operations in areas of their location. There are six brigades of such troops and they are commanded by two district commands – Pomeranian and Silesian HQs. The purpose of territorial defense is mainly home land defense with a wide range of non- war operations, such as natural disaster or terrorist threat related missions.

C.   POLITICAL AND ECONOMIC BACKGROUND OF THE POLISH ARMY

The last five years brought to fruition several significant events which changed the environment surrounding the Army in Poland. First of all, Poland joined NATO in 1999. In the same year, the Polish Army took an active part in allied operations in Kosovo and Albania. Further, in 2001, Polish parliamentary and military officials agreed and signed an eight-year plan for Armed Forces development. In the same year, Poland declared herself an active participant in "The War on Terror" by sending troops to

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[210] Information presented by Department of Finances in MOD February 2004 – source: www.mon.gov.pl

[211] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 141

Afghanistan. The declaration was further reinforced when Polish troops were deployed to Iraq in 2003. Finally, last September, the President signed the "National Security Strategy" which is a cornerstone document for future defense planning. These events all together created favorable circumstances for the reform and modernization of Polish Armed Forces. They also clearly indicate that "the political will" is the most important condition for change in the army and that presently it does exist in the Polish Parliament.

Although the Constitution of the Republic of Poland guarantees the non political character of the military, the relation between policymakers and executioners, in this case the Armed Forces, remains vital for both sides. In order to fully describe the current dynamics of the political-military sphere, I will first analyze the main provisions of the "National Security Strategy", and then I will relate the Army popularity among leading political powers in Poland. "The political will" mentioned above pressures the Armed Forces directly through budget restrictions. Thus, at the end of this subchapter, I will also include information about current budget issues and possible economic perspectives.

"The National Security Strategy", as I mentioned above, was signed by the President on 8 September 2003 during one of the meetings of the National Security Bureau. The document describes new realities in the field of defense, which were created by the change in the security environment after the September 11th attacks, which were officially declared by Polish Parliament "as an aggression against all democratic countries."[212] The perspective of the early European Union admission also brings new dimension to strategic thinking. The Strategy underlines that "the threat of high intensity conflict in Europe has disappeared."[213] Current defense challenges are composed of more global issues: namely- "international terrorism, weapons of mass destruction proliferation and unpredictable politics of authoritarian regimes."[214] Authors of the document agreed that the highest priority in Polish security thinking should be given to

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[212] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 124

[213] "Polish National Defense Strategy", signed by President Aleksander Kwasniewski, 08 September 2003, published on www.bbn.gov.pl , (Accessed 04.05.2004) p.1

[214] "Polish National Defense Strategy", signed by President Aleksander Kwasniewski, 08 September 2003, published on www.bbn.gov.pl , (Accessed 04.05.2004) p.2

international terrorism organized by super state groups. Part two of the strategy sets up the main goals for defense planning. It expresses that NATO's ability to conduct global missions together with sustainment of its classic defensive capabilities will remain key for security of Poland. It also states that the country will take an active part in the global stabilization process. This will require a highly dynamic foreign policy with the main goal of "creation of favorable international environment for security of Poland."[215] "The dynamic politic" as The Strategy underlines, will be supported by highly specialized maneuverable Armed Forces, whose operational freedom will be supported by Civil Defense, Special Services, Police and Border Guard. Within the international sphere, Poland recognizes NATO as a main platform for military cooperation and defense planning. Moreover, the Strategy describes bilateral relations with the United States as a vital component of the security environment. The document reads, "close political and military contacts with the USA, strengthened by cooperation in Iraq, are adding to significant achievements in Polish defense policy."[216]   In the near future, in accordance with the document, Poland will put endeavor to meet requirements defined during the NATO summit at Prague in 2002. The authors also stress the importance of relations with Russia and the Ukraine. Poland will advocate a special relationship between NATO and Russia. The Ukraine will also gain support on her way to Western structures. One of initiatives in this sphere was creation of joint Polish- Ukrainian battalion in November 1997.[217] In the sphere of relation with the European Union, it is said clearly that Poland will "support both military and civil capabilities"[218] of the Union. The document underlines that our input to ESDP is necessary in order to strengthen our voice in the field of international politics. At the same time Polish input to UN military initiatives is not going to suffer. The country will continue to offer military, law enforcement and civilian

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[215] "Polish National Defense Strategy", signed by President Aleksander Kwasniewski, 08 September 2003, published on www.bbn.gov.pl , (Accessed 04.05.2004) p. 5

[216] "Polish National Defense Strategy", signed by President Aleksander Kwasniewski, 08 September 2003, published on www.bbn.gov.pl , (Accessed 04.05.2004) p. 7

[217] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 103

[218] "Polish National Defense Strategy", signed by President Aleksander Kwasniewski, 08 September 2003, published on www.bbn.gov.pl , (Accessed 04.05.2004) p. 8

personnel to support the execution of UN mandates. Section "D" of chapter II is focused on bilateral contacts with bordering countries. Russia occupies a special position there; her cooperation with NATO and EU will be fully supported by Poland. The Strategy emphasizes bringing European security and economic initiatives to the Kaliningrad District. Finally, the document relates specifically to the Armed Forces. The Strategy not only ensures territorial integrity of the country and bringing help to allies under article 5 provision, but it also ensures that the Armed Forces are responsible for "building position in NATO and European Union."[219]   The Strategy defines main spheres in which capabilities are to be improved in the nearest future. These spheres are:

-"protection against weapons of mass destruction

- command and control systems

- combat power and readiness of expeditionary component

- strategic lift and sustainment capability."[220]

The document places special emphasis on importance of expeditionary forces' capabilities and readiness status. Effectiveness of these forces is to be assessed by specially organized Strategic Defense Reviews.

The current policy was put into practice and was approved by Polish Foreign Affairs' Minister Cimoszewicz during his speech to the Parliament on 21 January 2004. He outlined the main goals of foreign policy for the current year. The War on terror and WMD counter proliferation were mentioned as main concerns in the upcoming period. Włodzimierz Cimoszewicz underlined that "the shift of Polish foreign policy beyond European borders gives her new dimension and requires new approach to international security matters."[221]   The Minister further spoke about joint American- Polish operations in Iraq. In his view, our commitment there, strengthens positive transatlantic relation for initiatives like F16 sales, industry development and even travel conditions. In

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[219] "Polish National Defense Strategy", signed by President Aleksander Kwasniewski, 08 September 2003, published on www.bbn.gov.pl , (Accessed 04.05.2004) p. 11

[220] "Polish National Defense Strategy", signed by President Aleksander Kwasniewski, 08 September 2003, published on www.bbn.gov.pl , (Accessed 04.05.2004) p. 11

[221] Cimoszewicz, Wlodzimierz, Polish Foreign Affairs Minister, speech at Polish Parliament 21 Jan 2004

relation to ESDP, Włodzimierz Cimoszewicz aware of US suspicions in that matter, stressed that Poland will support all initiatives, which "are not weakening or duplicating NATO functions."[222] Following the same approach, the Deputy Foreign Affairs Minister, when relating to terrorism, declared that, "unconventional global threats require a non standard, but well coordinated action."[223]

These few outlines of Polish the "National Defense Strategy" and foreign policy goals set in 2004 clearly indicate that the new millennium brought new functions for our Armed Forces. They are no longer oriented exclusively on the country's borders defense. New security thinking changed the Army into a fully mature instrument of foreign politics.

The mission of the military has been more globally oriented and it looks like politicians have finally realized the advantages of having an effective force on hand even though major European conflict is no longer a threat. This approach has stimulated Polish military involvement in a few missions around the world. Those missions, which were not directed by the United Nations initiated many controversies across the whole spectrum of the Polish political community. Military operations abroad stimulated fierce discussions which served as a good research field for attitude towards military issues. The history of the Polish military involvement outside pure UN structures started back in 1994; during that year, the Special Forces unit took part in the US led operation in Haiti. In 1995 our Special Forces took an active part in tracking war criminals in the Balkans. Starting from March 1999, when Poland joined NATO, our military commitment abroad began to increase. In April of the same year the Polish Mountain Infantry company (140 troops) was ordered to participate in operation "Allied Harbor" in Albania. The decision to commit these troops in Balkans' region was signed by Polish President at 13 April 1999.[224] Shortly after, on 18 June 1999, the President signed orders for the deployment

[222] Cimoszewicz, Wlodzimierz, Polish Foreign Affairs Minister, speech at Polish Parliament 21 Jan 2004

[223] Zbigniew Lentowicz, "How to Respond to Barbarians?" Warsaw Rzeczpospolita, 23 February 2002, p. A4

[224] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 103

of an airborne battalion (800 troops) to Kosovo. They took part in operation "Joined Guard". However, the most dynamic political debate was initiated by the last events connected to the US led "War on Terror". In November 2001 the President signed the decision to deploy a contingent of 300 troops and Navy ships to Afghanistan. This document states that "War on Terror must base on international solidarity. Poland must take part in these activities. […] We know well that allied support and international solidarity in such situations have extraordinary meaning."[225] The first six months of this mission's cost was 30 million zloty. [226] High tension between supporters and the opposition for a Polish foreign policy line was further stimulated in 2003. In June of that year, the President signed the decision to deploy a contingent of 2500 troops to Iraq. Additionally, the Polish Army was to command a sector of the Multinational Division which highly increased our responsibility. The mission divided whole world - the controversies spread through the Polish society as well. Chief of The National Security Bureau, Marek Siwiec, wrote that if we do not commit ourselves in Iraq "we will sentence ourselves to political degradation", he further stated that "the time has come to prove in practice what our solidarity and credibility are worth, it is also the time to see how our Army performs in extremely difficult conditions."[227] This argument however does not apply everyone.

The decision to send troops to Iraq was undertaken by the left wing government. The left, mainly represented by Democratic Left Alliance (SLD), used to compose one political block together with the Polish Peasant Party (PSL). The block had a sheer majority in Parliament and it was strongly represented in government (with Prime Minister Leszek Miller who is a member of SLD). As long as the coalition was cohesive there was no question that the Polish Left was fully supporting Armed Forces development programs and foreign commitment. The President of Poland Aleksander Kwaśniewski, the Army highest supervisor, also had a left wing background.

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[225] Decision of the President of the Republic of Poland to send troops to Afghanistan signed 11th November 2001

[226] Warsaw Rzeczpospolita, 23 November 2001, p. A3; Deputy Defense Minister Janusz Zemke, Warsaw Rzeczpospolita, 28 November 2001, p. A2; Zycie Warszawy, 9 February 2002, p. 5

[227] Article in Newspaper „Rzeczpospolita" nr 187, 12 Aug 2003 written by Minister Marek Siwiec

Consequently, the decision to deploy troops to Iraq was achieved in the atmosphere of understanding between the President, the Prime Minister and Parliament. The situation changed as soon as the PSL-SLD coalition broke down. As a result of controversial negotiations of EU accession terms PSL left the block and switched to the opposition. The party started to align with Self-defense - another peasant representation with a right wing program. The Self-defense representatives expressed other views towards military issues – their anti global position created potential danger for the realization of Armed Forces modernization programs. In one of the interviews the Self-defense leader Andrzej Lepper concluded, "we have always been seen by world's public opinion as a nation heroically fighting for independence. The World admired us for that reason. President Aleksander Kwaśniewski together with current government changed our country at the beginning of the new century into an aggressor."[228] Such comments on operations in Iraq and Afghanistan did not bode well for the future of expeditionary forces. The Self-defense's leader further expressed his fear that France and Germany could revenge on Poland by withdrawing their support from certain initiatives. The party so far has not declared a strong voice in defense planning since they were not even represented in the Defense Commission of the Parliament. The situation, however, can change after next elections – especially if Self-defense allies with PSL. Hopefully the PSL will soften Self-defense opportunism to the new security thinking.

Military interest is currently best defended by center parties. Two leading bodies – Citizen's Platform (PO) and Law and Justice (PiS) are clearly supporting defense reforms and globally oriented security policies. PiS, in articles publicized at its web page, states that "our troop's service in Iraq brings us good opinion all around the world."[229] The Party closely monitors the defense budget and reacts dynamically for any negative signs. For example through the same web article PiS is pushing the Ministry of Defense to improve the quality of bullet proof protection equipment for troops. PiS conducts many useful legal and economic initiatives to stimulate military development. For example, at the beginning of this year they have started their program to remove VAT

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228 Interview with Andrzej Lepper, head of „Self Defense" party

229 www.kp.pis.org.pl/aktualności/komunikaty/2003-10-09.htm, official web page of the PiS party

from the military equipment purchase. This of course would allow much savings in the defense budget. The PO plays a quite similar tune – the party (as well as PiS) is strongly represented by the Parliamentary Defense Commission. PO, as its deputy announced in a meeting of the Commission on 20 February 2004, plans to forward to all parties a project of agreement which would concern long term defense reform planning. Such initiatives, according to deputy Komorowski, would cover issues such as: full professionalization and the current status of the defense budget. The same deputy, expressing the will of the party during the Commission meeting stated that, "defense reforms must be sped up. Economic effort must be shifted to areas which are decisive for modern character of Armed Forces."[230]   Such statements can create an optimistic prognosis - especially because PO and PiS are among parties ranking highest in public opinion polls.

The importance of political endeavors is best expressed by all restrictions put on the defense budget, which has projected the year 2004 to be a success. 2004 is the second year of the six year long modernization program. The first phase of the plan is finished; the structure of the personnel pyramid has changed after the introduction of professional NCO and private corps. The goal for 2004 is to initiate the phase of stable development. There are many projects going on, the three major ones are: F16, new APC and new anti tank missile acquisition. The fighter program is financed from outside the MOD budget. New pragmatic legislation which is going to be effective from July 1st of this year, also will bring forth important changes to Polish budgetary debates. Starting with 2005, the MOD budget will be fixed on a 1.95% level of the GDP planned for the next fiscal year. It provides military planners with the comfort of having a more or less stable financial basis.

The 2004 budget as it is shown in APPENDIX C/4, is 16.751,1 million Zloty which is approximately 4.650 million Dollars.

The defense budget in comparison to 2003 increased nominally by 5.7% and realistically, concerning the inflation rate by 3.7%.[231] In total the defense budget makes

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[230] Report nr 2852/IV from meeting of Defense and Public Finances Parliamentary Commissions at 20th Feb 2004, speech by PO deputy Bronisław Komorowski

[231] Information presented by Department of Finances in MOD February 2004 – source: www.mon.gov.pl

8.38% of entire the national budget. The year 2003 was a time of drastic personnel reductions. The Polish Armed Forces were reduced to 170.000 troops. The goal for the personnel strategy is to reach a level of 150.000. Reductions touched heavily the officer corps, from "4.800 colonels 800 were to remain in the army, 7.500 lieutenant colonels were to be reduced to 2.500, the number of 9.600 majors was to be cut down to 3.200."[232]As a result, the structure of budget allocation has changed. Personnel's spending is steadily decreasing in relation to other sectors. In 2004 16.2% of all MOD money is planned to be spent on new equipment purchases. Last year this sector of the spending consisted 13.3% of the budget. Comparison of budget allocation is shown on Table 2.

[232] Defense Minister Bronislaw Komorowski, Warsaw Polska Zbrojna, 22 September 2000,p. 5, 16-18

Table 2:   MOD budget allocation in 2003 and 2004[233]

TYPE OF SPENDING	2003	2004
New equipment purchase	13.3%	16.2%
Training and maintenance	30.0%	29.5%
Social (retirement pay)	23.9%	23.6%
Salaries	32.8%	30.7%

Since Poland has taken part in operations in Iraq and Afghanistan, financing this mission began to be an important aspect of the MOD budget. In 2004, for the first time, a special subgroup was separated from the rest of the budget. This subgroup will be spent exclusively on foreign operations financing. Currently the Polish MOD budget pays for missions in Iraq, Afghanistan, Kosovo, Bosnia and Macedonia.

To conclude, the budgetary prognosis looks optimistic. The budget, although still not impressively high, is now fixed on 1.95% level of the GDP – no other institution in Poland benefits from this advantage. Gen. Pietrzyk, current Land Forces Commander stated flatly in front of the parliament that "he could not implement the reform if he were guaranteed the 1.95% of GDP."[234] Personnel reductions and eradicating non-perspective equipment allows to save money and to change the structure of the budget. Poland as a state takes seriously modernization of the Armed Forces what is manifested among the others, by financing F16 purchases from the national reserves. "Serious Approach" is also seen in contribution to NATO requirements. In 2002, Poland had

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[233]Information presented by Department of Finances in MOD February 2004 – source: www.mon.gov.pl

[234] Jeffrey, Simon, P., *Poland and NATO, a Study in Civil Military Relations*, (Rowman and Littlefield Publishers, 2004), p. 115

successfully completed "139 objectives and 98 tasks of the 196 objectives and 112 tasks proposed by NATO."[235] Moreover Polish Armed Forces managed to rebuild their prestige after unfortunate past of the communist time. In March 2002 public opinion polls showed 79% of Polish population declaring "trust" to the army (comparing 38% for courts of law and 72% for police).[236]

Having defined the current state and the environment of the Polish Army it is now time to think about its future. The Army must change in order to confront successfully requirements of contemporary warfare described in Chapter I. One way would be to copy solutions employed by more experienced allies. Chapter II described some of them used in the US transition model. The question however remains what is affordable and feasible to specific Polish case. The following chapter will provide a conclusion, recommending some of the US solutions to be used in Polish Army reforms.

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[235] Cieniuch, Andrzej, General, Deputy Chief of General Staff, Polish Armed Forces, information given to Polish Parliament, 04 June 2002.

[236] Warsaw Gazeta Wyborcza, 24 April 2002, p. 8

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IV. CONCLUSION – PROPOSAL FOR STRUCTURAL REFORMS OF POLISH LAND FORCES

Within the first two chapters of my thesis I analyzed the nature of contemporary war and the US Army response to the changing environment. Chapter three presented a picture of the specific conditions surrounding Polish Land Forces. Within this Chapter I will integrate these earlier observations – as a result I will asses which of the US Army development trends could be relevant and feasible for the Polish Armed Forces.

This chapter emphasizes how much US strategic security thinking differs from the Polish. Strategic dominance has never been a Polish aspiration. Poland's current goal is rather to have a large pool of strategic options. The country, as was manifested during the recent Iraq crisis, is struggling to achieve an independent position in international affairs. In order to do that Poland needs resources to attract potential partners. Limited strategic response capabilities can serve as such a resource desired by some of Poland's allies. In sum, the goal of Polish security policy is not "to lead a club" but rather to sit in the "first row" during the meetings of "the club". In this context one obvious conclusion is that Poland cannot simply copy US solutions due to a significant disparity in resources and aspirations. Another conclusion however is that in order to "have a seat at the first row" Poland must pay close attention to what is going on in its allies' security spheres. Such close monitoring should enable Poland to create future concepts linked to overall trends. In following Chapter I would like to propose such a potential concept. This approach is constructed based directly on observations made in the previous chapters.

A. FUTURE REQUIREMENTS

Despite mentioned differences between Polish and the US Land Forces, both institutions are experiencing similar pressures. Strategic responsiveness for Poland does not only mean a capability to participate in "coalitions of the willing" led by the US. This requirement is also stressed by security institutions of which Poland is a member. As commander of Polish Land Forces Gen. Pietrzyk mentioned: "new NATO's strategic concepts and Polish doctrinal documents are pushing for new solutions, making military

forces more mobile in strategic context."[237] The goal of global mobility is not exclusively reserved for superpowers. In order to be a credible ally, smaller states like Poland have to demonstrate a capability to contribute to worldwide military efforts wherever it deems sensible. Gen. Cieniuch pointed that, "Polish Armed Forces for the first time in their history must be prepared so much to conduct operations outside the country; such change requires thorough reforms."[238] Deputy chief of staff Polish Land Forces Gen. Michalski wrote that, "The capability of conducting peace keeping and peace enforcement operations around the globe is our task. Thanks to that we will remain a credible ally in the bloc."[239] Light, mobile and professional forces are also demanded by the NATO Defense Capability Initiative. As gen. Pietrzyk further mentioned in his article, by an "increase in strategic mobility of our troops we will contribute to the Initiative."[240] The European Union and its emerging military structures are pushing for expeditionary capabilities as well. The "Battle Groups" concept assumes that the countries participating in the European Defense Initiative will contribute approximately 1500 men strong self deployable and self sustainable contingents. Perspective of such requirements, potential future coalitions of willing and NATO goals are setting on the direction – expeditionary forces. According to the Land Forces Commander: "in perspective of 25 years, 30-40% of Polish Land Forces should have specific expeditionary character."[241] In this context Polish Land Forces are similar to their US counterpart – future development will be highly dominated by the struggle to increase strategic responsiveness. The expeditionary forces in Polish case however must "also be

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[237] Pietrzyk, Edward, General, Polish Land Forces Commander, article for Land Forces Gazette – www.army.mil.pl/glowna/dowodca/art1.html , (Accessed 21.04.04)

[238] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[239] Michalski, Włodzimierz, General, Chief of Staff Polish Land Forces Command, "Iraq – School of Warfare", article for Land Forces Review 7/2003

[240] Pietrzyk, Edward, General, Polish Land Forces Commander, article for Land Forces Gazette – www.army.mil.pl/glowna/dowodca/art1.html , (Accessed 21.04.04)

[241] Pietrzyk, Edward, General, Polish Land Forces Commander, article for Land Forces Gazette – www.army.mil.pl/glowna/dowodca/art2.html , (Accessed 21.04.04)

ready to conduct the home land defense as a part of the whole defense apparatus."[242] Although the scale of capabilities of the US Army is significantly higher, some of the US development tendencies are relevant to the Polish case.

The new character of the Army raises the question of professionallization. Many of our close allies like France and the Czech Republic have already resigned from conscription. Polish Land Forces are currently 50% professional. Detailed analysis conducted by Jerzy Telep and Roman Polak say that, "85.000 man strong fully professional forces would be a feasible alternative for the current Polish 130.000 strong, 50% professional forces."[243]Their full professionallization however causes a lot of controversy. Many military specialists, including this author, insist that getting rid of conscription would be a great, irreparable mistake. Former II Corps Commander, gen. Stachowiak underlined that, "With her specific geopolitical location and historical experience, Poland cannot entirely resign from conscription. Territorial defense mechanism must be in place to ensure national security in future."[244] This issue will be further addressed in the second subchapter in respect to the territorial defense component of Land Forces.

B.   EXPEDITIONARY FORCES

The ongoing mission in Iraq has proven that Polish Land Forces must create a dedicated expeditionary component in order to operate effectively in current environment. The study of the preparation for the deployment to Iraq shows how difficult it was to organize a contingent from existing structures. The whole component was basically built from scratch within a few weeks. Additionally, the multi-national character of the mission further complicated the task. During the whole preparation process "one of the most difficult tasks was to create an organizational structure for the division basing on 20 nations' contingents. […] Polish maneuver elements were taken

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[242] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[243] „Direction – Professional Army", Roman Polak, Jerzy Telep p. 128

[244] Stachowiak, Mieczysław, General, former II Corps Cdr, current assistant to Chief of General Staff, interview with the author 12.09.2004

from two different brigades: the 12th and 10th Mech."[245] Such experience shows how much the army can benefit from having a fixed and ready strategic response force. As gen. Stachowiak stated: "it is absolutely necessary to plan for future dedicated expeditionary Land Forces Component – possibly a specialized division size unit."[246] Gen. Cieniuch mentioned during the interview that, "although expeditionary forces are expensive, Poland should maintain such contingent within its Land Forces – size of such unit should oscillate around 30% of all forces."[247] The after-action reviews published by the first rotation of the Polish contingent in Iraq further stress that the potential future expeditionary component should be structurally compatible with our allied troops. During the first rotation, the Polish battalion's structures were highly incompatible with their US counterparts. In some cases one Polish company was taking over a sector from two US companies (even though the number of soldiers in a single Polish company is less than in its US counterpart). Battalions with 450 troops were taking over responsibilities from battalions of 1000 and more troops. As a result "military presence" in certain sectors significantly decreased."[248] The staff structures were also lacking compatibility: "In some cases – as it happened in case of divisional G2 section, 3 man sections were taking over responsibilities from 8 man USMC staff sections."[249]

Summing up the above analysis, Polish Land Forces need the reform which would make them an effective and compatible expeditionary troop. Such a requirement has never been put on the Polish Armed Forces in their entire history. The reforms must be planned in a way that the expeditionary components would be compatible with their

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[245] Tyszkiewicz, Andrzej, General, Polish Army, former Commander of Multinational Division in Iraq, *Experiences and Conclusions from the First Rotation of Polish Military Contingent in Iraq*, (Warsaw, Land Forces Review 8/2004)

[246] Stachowiak, Mieczysław, General, former II Corps Cdr, current assistant to Chief of General Staff, interview with the author 12.09.2004

[247] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

[248] Tyszkiewicz, Andrzej, General, Polish Army, former Commander of Multinational Division in Iraq, *Experiences and Conclusions from the First Rotation of Polish Military Contingent in Iraq*, (Warsaw, Land Forces Review 8/2004)

[249] Tyszkiewicz, Andrzej, General, Polish Army, former Commander of Multinational Division in Iraq, *Experiences and Conclusions from the First Rotation of Polish Military Contingent in Iraq*, (Warsaw, Land Forces Review 8/2004)

NATO and EU allies and potential coalition partners. A study of US structural developments provides a few ideas which merit further discussion.

The first step in building a dedicated expeditionary force in Poland has already been accomplished. On 1 July 2004 the Ministry of Defense established an Operational Joint Headquarters. This command element is going to be "responsible for planning, preparation and execution of joint expeditionary missions."[250] It will also be responsible for joint training, enabling "different arms and services to train together at all times, changing task organization frequently."[251] Such HQs were established in 1996 in Great Britain and in 2001 in Germany.[252] This institution surely will help in harmonizing the efforts of all services. It is especially important since Polish experience in joint operations is rather minor.

The study of US development trends shows that the Stryker Brigade idea may be especially interesting for Polish Land Forces. Concerning the fact that "Land Forces Modernization Plan assumes equipping one third of forces with new wheeled APC until the end of 2006"[253], the medium force concept looks very attractive. The US experiment with Stryker Brigades has been noticed by the Polish General Staff. Army planners are following closely the results of their employment in combat missions. Land Forces Commander gen. Pietrzyk expressed his interest in the article for Land Force Gazette. He wrote that the "United States is organizing Interim Brigades with three infantry battalions and combat support units. Those forces are to be capable to be deployed anywhere in the world in few days. At the same time best among NATO armies are carefully reducing numbers of tanks. Their reduction is accompanied by increase of combat power of those remaining in service. Such trends should be also represented by our Land Forces."[254]

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[250] Wytor, Włodzimierz, Major, Polish Army Operational Command, *Operational Command*, article in Land Forces Review, 10/2004

[251] House, Jonathan, M., *Combined Arms Warfare in the Twentieth Century*, (University Press of Kansas 2001), p. 282

[252] Wytor, Włodzimierz, Major, Polish Army Operational Command, *Operational Command*, article in Land Forces Review, 10/2004

[253] Pietrzyk, Edward, General, Polish Land Forces Commander, article for Land Forces Gazette – www.army.mil.pl/glowna/dowodca/art1.html , (Accessed 21.04.04)

[254] Pietrzyk, Edward, General, Polish Land Forces Commander, article for Land Forces Gazette – www.army.mil.pl/glowna/dowodca/art1.html , (Accessed 21.04.04)

The light infantry which Poland currently deploys in Iraq is taking casualties due to of lack of survivable combat power. As was underlined by LTC Douglas A. Macgregor, "in the wars of the future there is simply no point in deploying highly trained light infantry without mobility and protection."[255] Gen. Czerwinski – present commander of 1st Mechanized Division and former deputy commander of the Multinational Division in Iraq is also in favor of medium brigade concept. He stated that, "looking at the US experience with the Stryker brigades, I think that Polish Land Forces should plan for organization of at least one brigade of such type. That unit would highly increase our responsiveness in situations with which we are dealing today."[256] The prospect of having new APC's in 2005 creates an opportunity to follow the US steps in medium brigade development path. PATRIA APC is going to be the base chasse for a whole family of the vehicles. Polish Land Forces should push to develop fire support vehicle in order to avoid the shortage which the US Army is experiencing due to problems with the AGS project. Polish planners also have to understand that the medium brigade concept requires a thorough structural change; it does not take only replacing the tracked APCs with the wheeled ones, leaving the brigades' structures as they were. Hopefully the popular interest in this issue will enable to implement the reform properly.

Suggestions of taking the example of the US Stryker brigade concept however does not mean that the whole Land Forces of Poland should be oriented on the medium type units. There is a big debate nowadays in Poland about the "weight" of our future Army units. Numerous analysts are expressing the disregard for value of the heavy forces. Maj. Mieczyslaw Malec, specialist in the Ministry of Defense, stated that, "looking at the tasks which Polish Armed Forces are conducting today and being aware of the future potential challenges it is reasonable to say that the development of organizational structures should be rather directed to light forces."[257] Gen. Stachowiak, the assistant to Chief of General Staff also shares the idea of making our forces lighter.

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[255] Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997), p.77

[256] Czerwiński, Piotr, General, 1st Mechanized Division Commander, former deputy commander of Multinational Division in Iraq, interview with author 13.09.2004

[257] Malec, Mieczyslaw, Major, Polish Army, specialist in Polish MOD, foreign affairs department, graduate of the NPS, interview with author 15.09.2004.

During the interview he mentioned that, "concerning our current geopolitical situation, it is reasonable to say that Poland needs no more than one typical heavy brigade. Such brigade however should be equipped with top line vehicles – possibly Leopard IIAV in order to fulfill the gap in combat power."[258] Land Forces commander, gen. Pietrzyk represents a more balanced view; he would like to have "one third of light forces, one third of medium and one third of heavy units."[259] American experience shows that balanced force structure gives the most flexibility. While creating seven medium brigades, US Army still keeps its "legacy force" intact. Units like the heavy 4 ID described in Chapter II, are still being developed and their value has been confirmed once again during Operation Iraqi Freedom. Balanced approach is expressed in numerous US publications. One of the RAND studies indicates that: "armored forces do not take heavy casualties and the experience in Bosnia, Haiti and Somalia indicates that armored forces play a decisive role in the establishment and preservation of civil order."[260]

The medium brigade idea and the balanced force structure are the two concepts which I consider worth planting on Polish ground. Still the question of the structure for such forces remains open. As Andrew Krepinevich noted, "revolution in military affairs requires not only new technology, but new operational concepts and organizations."[261] Since Polish Land Forces are way smaller than their US counterpart, structural changes should be at least theoretically easier to implement. That means that organizing our force structure we can go a step further than the US Army. Numerous American analysts are expressing the opinions that the information age gives a green light for "flattening" of the organizational structures. In the nearest future, as I mentioned in Chapter II, some of the command levels may be excluded. LTC Douglas A. Macgregor writes that the future forces most likely will be dominated "by a warfighting organizations that are both

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258 Stachowiak, Mieczysław, General, former II Corps Cdr, current assistant to Chief of General Staff, interview with the author 12.09.2004

259 Pietrzyk, Edward, General, Polish Land Forces Commander, article for Land Forces Gazette – www.army.mil.pl/glowna/dowodca/art4.html , (Accessed 21.04.04)

260 Taw, Jennifer, Hoffman, Bruce, *The Urbanization of Insurgency – The Potential Challange to US Army Operations*, (RAND study 1994).

261 Andrew F. Krepinevich, *Cavalry to Computer: The Pattern of Military Revolutions,* (The National Interest, No. 37, Fall 1994), p. 30.

smaller in size and more numerous in quantity than the existing divisions."262 According to Macgregor, such organizations would consist of combined arms battle groups; their detailed structure is shown in APPENDIX D/1. In the same source Macgregor gives the example of British Army approach, he writes that "they have long regarded the division structure as an echelon of command and control rather than a fixed formation. Today the combination of reductions in numbers of units and troops has driven the British Army to orient the contingency planning along lines of reinforced brigade structures commanded by brigadiers."263

Change of the structure is as well foreseen by Polish Land Forces commander gen.Pietrzyk. In his article to Land Forces Gazette he underlined the need for "new combat blocks", he also stated that "future units should have a modular character; such organization would enable to use them as a whole or only their detached elements."264 The "group approach" organizes the Land Forces basing on components of the reinforced battalion size. Such concept, as it is underlined by the US Army Research Institute for Behavioral and Social Sciences, "organizes army ground forces in peace time for the way they are likely to fight in war without imparting rigidity o a structure that will require flexibility."265 Concerning the current state of Polish Land Forces and proposed higher directions of reform, the combat group concept forwarded by LTC Macgregor looks attractive. In his book "Breaking the Phalanx" he proposed resignation from the traditional divisional structure. Instead he suggests building reinforced brigade size battle groups, which would be commanded by joint HQs. Concerning character and tasks of Polish Land Forces especially three types of combat groups' structures are interesting.

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262 Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997), p. 74

263 Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997), p. 89

264 Pietrzyk, Edward, General, Polish Land Forces Commander, article for Land Forces Gazette – www.army.mil.pl/glowna/dowodca/art3.html , (Accessed 21.04.04)

265 Holz, Robert, F., Hiller, Jack, H., McFann, Howard, H., *Determinants of Effective Unit Performance: Research on Measuring and Managing Unit Training Readiness*; (US Army Research Institute for Behavioral and Social Sciences, July 1994), p. 176

The "heavy combat group" with mission profile of "decisive maneuver operations"[266] could be organized basing on current heavy armor and mechanized brigades. Light recon strike group mission is "to be delivered by air in order to conduct close and deep maneuver operations, support forced entry operations, contingency operations and Operations Other than War (OOTW) as needed."[267] Such troops could be constructed in Polish Land Forces basing on brigades being scheduled for having wheeled APCs. Finally Macgregor's "airborne – air assault group" concept could be as well useful in Land Forces of Poland. Typical mission for that type of unit is "to be delivered by air in order to conduct Forced Entry Operations, close and deep economy of force operations in support of decisive operations, contingency operations and OOTW as needed."[268] Such light forces could be organized basing on existing three light infantry brigades.

Polish Land Forces currently consist of 30 brigades of various types – their types are shown at APPENDIX D/4. Concerning their character, limitations, number of equipment and future requirements it is reasonable to propose their reorganization into two heavy combat groups, two light recon-strike groups and one airborne – airmobile combat group. Additionally the existing Special Forces Regiment would remain as an independent troop. Such elements could be commanded by higher described Joint Headquarters. This arrangement would create a mixed, light – heavy land component to the Polish Armed Forces. Similar concept was expressed by gen. Cieniuch, who mentioned during interview that Polish Land Forces "should have one third of light and two thirds of mixed medium – heavy forces."[269]

The light airborne – airmobile element would enable to conduct rapid reaction operations as well as peace keeping in stabile regions. Two medium weight battle groups with battalions of Stryker – type troops, would be able to conduct expeditionary

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[266] Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997), p.75

[267] Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997), p. 79

[268] Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997), p. 77

[269] Cieniuch, Andrzej, General, Deputy Chief of Staff, Polish Armed Forces, interview with author 19.10.2004.

operations in more hostile environments. They would be especially useful to counter urban insurgencies like those we are fighting now in Iraq. Two of such groups would also be able to conduct rotations in case of prolonged deployments. Moreover they could perfectly fit into European Union "battle groups" concept. Finally heavy combat groups would enable to express clearly our political intentions – they could be a part of the potential coalition in high intensity conflicts, they could also reinforce medium brigades with detached heavy elements. Most of all however, they would deter potential future threats for home land security.

Of course the ability of Poland to enact a reform of this scope is constrained by limited resources and capabilities. There are many specific conditions which impact pushes to modify the structure proposed in "Breaking the Phalanx". The battle groups' structures with proposed changes are shown in APPENDIX D/3. Polish force planners must pay close attention especially in the field of logistics. Since our APCs and most of other vehicles are different than the US counterparts, our battle groups should have heavier logistic echelons. Gen. Stachowiak underlined during the interview that, "presently one of the biggest problems for our Land Forces is a logistic base for expeditionary operations like those we conduct in Iraq or Afghanistan."[270] Our Land Forces also do not enjoy having prestocks or prepositioned equipment stocks. Thus supplies in majority of classes have to be delivered from the home country. Such need requires very careful approach to both battle group and higher echelon logistic structures. The US trend of digitization of the logistic support would certainly improve the situation. As quoted in the second chapter RAND study indicates, systems like Total Asset Visibility would "allow leaner logistics networks to be put in place in the theatre of operations."[271] Current mission in Iraq shows that Polish expeditionary units will need robust engineer capabilities as well. Reports from Iraq stated that during the first rotation Polish engineers "destroyed: 640 pieces of unexploded ordnance, 200 improvised explosive devices, they also supervised 18 Iraqi ammunition depots and organized central

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[270] Stachowiak, Mieczysław, General, former II Corps Cdr, current assistant to Chief of General Staff, interview with the author 12.09.2004

[271] Nichiporuk, Brian,. *Forecasting The Effects of Army XXI Design Upon Multinational Force Compatibility*, (arroyo center), www.rand.org.publications/DB/DB279/DB279.pdf (Accessed 08.06.2004)

ammunition depot in Najaf."[272] Such statistics are indicating that the detailed structures of engineer companies must be closely researched. Currently Polish Land Forces are having two engineer brigades and fourteen companies in structure of the maneuver brigades. Such amount of resources shows that creation of robust engineer components for battle groups is achievable.

Looking at our present experience in Iraq it is reasonable to say that in the future Poland would be bringing Eastern European partners to the coalitions and maybe even to EU or NATO structures. Such perspective creates another requirement for future land components structures. Reports from the preparation process to the Iraqi mission underline numerous problems. For example in case of Ukrainian contingent "orders and presentations prepared in English were not understandable, NATO terminology had to be explained in Russian language."[273] The conclusion is that Polish command and control structures need strong liaison elements – Russian speaking groups which could provide the link to the potential future partners. The C4I system, especially if the Polish Army is to flatten the command structures by adaptation of battle group system, must be improved. Gen. Czerwinski underlined during the interview that the "Polish Army needs improvement in specialized C2 equipment. Digital command and control is necessary if the Army in the future is to conduct effectively operations like those in Iraq and Afghanistan."[274] According to him, the digitization in Polish Land Forces should be started at the lowest levels of command since the contemporary warfighting character "puts the highest pressure and responsibility on command levels battalion and below."[275] Macgregor's idea of the C4I battalions also gives interesting capabilities which should be seriously considered by Polish Army planners. The concept shown in detail in

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[272] Tyszkiewicz, Andrzej, General, Polish Army, former Commander of Multinational Division in Iraq, *Experiences and Conclusions from the First Rotation of Polish Military Contingent in Iraq*, (Warsaw, Land Forces Review 8/2004), p. 40

[273] Tyszkiewicz, Andrzej, General, Polish Army, former Commander of Multinational Division in Iraq, *Experiences and Conclusions from the First Rotation of Polish Military Contingent in Iraq*, (Warsaw, Land Forces Review 8/2004), p. 8

[274] Czerwiński, Piotr, General, 1st Mechanized Division Commander, former deputy commander of Multinational Division in Iraq, interview with author 13.09.2004

[275] Czerwiński, Piotr, General, 1st Mechanized Division Commander, former deputy commander of Multinational Division in Iraq, interview with author 13.09.2004

APPENDIX D/2 links the surveillance assets directly to the C2 net. Need for such arrangement was expressed by gen. Stachowiak, who mentioned during the interview that, "Thinking about future force structure, special focus should be placed on command and intelligence assets, their allocation and integration."[276]

Summing up, a future Polish Expeditionary Land Forces Component can benefit from the US experience in fielding medium brigades. A wheeled, deployable element based on one universal chassis is achievable for Polish Land Forces and can significantly increase their effectiveness. Poland, just like the US, should not resign entirely from heavy forces. Instead the balanced force structure should offer the highest agility. Such a force however in the Polish case can be organized along a battle group structure which is not yet represented in the US Army. Flattened command and control structure however should be supported by the digital C4I systems in order to allow one staff element to control more troops. In this sphere Polish Land Forces should take advantage of technical and tactical experience of the US "network centric" warfare projects.

C.   HOME DEFENSE FORCES

The expeditionary forces however are not the only part of the land forces. The territorial defense mechanism is a less capable but nonetheless essential component of the Polish armed forces. Currently existing in Poland are six territorial defense brigades that maintain the responsibility for conscripts' training and home land defense. Their value was underlined by gen. Stachowiak, who mentioned during the interview that, "with her specific geopolitical location and historical experience Poland cannot entirely resign from conscription. Territorial defense mechanism must be in place to ensure national security in the future."[277] The present concept of Polish Land Forces assumes that, apart from fully professional "operational forces", Poland will still field territorial defense brigades basing on conscripts prepared to conduct military duties in the regions of their residence. The home land defense in Poland however still requires lots of reform.

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[276] Stachowiak, Mieczysław, General, former II Corps Cdr, current assistant to Chief of General Staff, interview with the author 12.09.2004

[277] Stachowiak, Mieczysław, General, former II Corps Cdr, current assistant to Chief of General Staff, interview with the author 12.09.2004

It is worth mentioning a few of the most important and necessary reforms of the territorial defense force. First, it needs new legal and structural solutions. It is especially vital in the era of War on Terror of which Poland is one of the most active participants. Such "new solutions", as gen. Czerwinski underlined should consist of "complex arrangements integrating efforts of the territorial defense, police, civil defense and other services responsible for crisis management."[278] Second, the operational forces' reserve training remains a problem. So far there is no effective concept on how to produce reserves for active, operational forces responsible for expeditionary missions. The US Army already suffered from that problem in 1991, when the Gulf War "revived the same issue that had plagued France before 1914 – the readiness of army reserve units to fight as soon as they were mobilized."[279] The Gulf War of 1991 proved that the current training system of the National Guard does not make her combat units ready to be deployed. From the three mobilized National Guard's brigades, only one passed the test at the NTC. From these three however none was deployed to the Gulf. US Army Reserve on the other hand proved to be a useful tool. Active element of the US Army in the Gulf was reinforced by CS and CSS reserve components. The US Army Reserve deployed "94% of the Civil Affairs units, 89% of the prisoner of war military police elements, 69% of the postal support units, 65% of the petroleum elements, 63% of the psychological operation elements, and 59% of the water handing assets."[280] The Secretary Dick Cheney's said that the US Army "could not have done the operation"[281] without those reserve components. The Individual Mobilization Augmentee program run by the US Army also sounds interesting. Since numerous special skills are required in the modern military forces it becomes necessary to employ temporarily specialists from the civilian sector. The US Army uses reserve soldiers who "have civilian skills which match their

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[278] Czerwiński, Piotr, General, 1st Mechanized Division Commander, former deputy commander of Multinational Division in Iraq, interview with author 13.09.2004

[279] House, Jonathan, M., *Combined Arms Warfare in the Twentieth Century*, (University Press of Kansas 2001), p. 276

[280] Heller, Charles E., *Twenty First Century Force: A Federal Army And A Militia*, (US Army War College 1993), p.40

[281] Gellman, Barton, *Cheney Says Guard Units May Need Reorganizing*, The Washington Post, March 15, 1991, p. 34

military specialties", the active component benefits especially from use of these individuals "to assist in support, i.e., engineer, maintenance military police and medical."282

In summary, the effective concepts for active component reserve training and the territorial defense would greatly improve the capabilities of the Polish Army to conduct expeditionary operations. Placing CS and CSS units in the reserves would decrease the overall costs of training and maintenance allows a shift of financial resources to other sectors. It is necessary to put the Territorial Defense mechanism in place, especially if Poland wants to continue its active participation in the War on Terror. One can only imagine how such a mechanism would help to control a crisis situation like that experienced by Russia in Beslan. In reforming the reserve component, the Polish Land Forces can apply the lessons learned from the US experience in this field. However it is necessary to point out that the active forces are not operating in a vacuum and their reforms must be correlated with parallel reconfigurations in the reserve components.

Thorough analysis of the characteristics of contemporary warfare produces one general conclusion for future Polish Army development. As was indicated in Chapter I, the army needs an effective, deployable and sustainable expeditionary component. Such a component should be able to counter both asymmetric and technologically developed threats. Such elements should also be able to overcome logistic difficulties once being deployed far from their own bases. The Polish defense budget, as was indicated in Chapter III, is capable of supporting the steady development of such capabilities. That chapter also confirms the existence of the necessary "political will" to restructure the Armed Forces. However in order to achieve such goals Poland must not only spend its defense budget wisely, but it also must learn from more experienced allies. General development trends represented by the US Army present a wealth of relevant information for the Polish armed forces. Study of the Stryker Brigade concept, Army XXI and Army After Next provides valuable conclusions which may be used in defense planning reaching as far out as 2025. Although the scale of operations and the general strategic

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282 Heller, Charles E., *Twenty First Century Force: A Federal Army And A Militia*, (US Army War College 1993), p.61

concepts in the Polish and US cases are different, the challenges of warfare at the tactical and operational levels remain almost identical for the land forces of both countries. As mentioned in Chapter IV, the Stryker Brigade concept looks especially attractive since the Polish Armed Forces are currently fielding a new wheeled APC. The acquisition of the APC also indicates that the reforms in Poland are already going in a direction "parallel" to those of the US. This is highly important since 'compatibility' is vital for the effectiveness of the Polish Army.

US experience with digital command and control systems also provides valuable lessons learned for reforms in Poland. As one of the generals interviewed stated, the digitization of the C2 network in the Polish Army is "inevitable". New structural solutions like those proposed by LTC Macgregor are interesting as well. Implementation of such changes could be relatively easy, since Polish Land Forces are smaller than the US Marine Corps. As the first chapter of this thesis proves the complexity of battlefield is growing thus our forces should seek higher standards of effectiveness and compatibility among allies. Successful cooperation so far in Bosnia, Iraq and Afghanistan shows how important those problems are. Close study and application of the lessons learned from US military reform will undoubtedly make the Polish Land Forces more effective in NATO and the emerging European defense structures. Such change would be beneficial for both Poland and NATO. Since the political situation in Eastern Europe is still not stable, Poland's geographic position at the leading edge of NATO makes it imperative that it maintain a capable and compatible defense capability. Hopefully, recently started military reforms in Poland will help to achieve such a goal. From the Polish point of view, effective military reforms would strengthen the role of Polish Land Forces in Central and Eastern Europe. Poland is now leading the multinational contingent in Iraq and it is very probable that so far it is the only Eastern European country with the ability to accomplish such a mission. Further defense transformation will strengthen Poland's leading defense role in the region. This however can only happen when Polish decision makers learn from the wisdom of more experienced allies. Hopefully some of solutions presented in this thesis will add to future defense planning.

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APPENDIX A/1: force compositions in recent US led military operations

Role Of The Army In Joint Operations
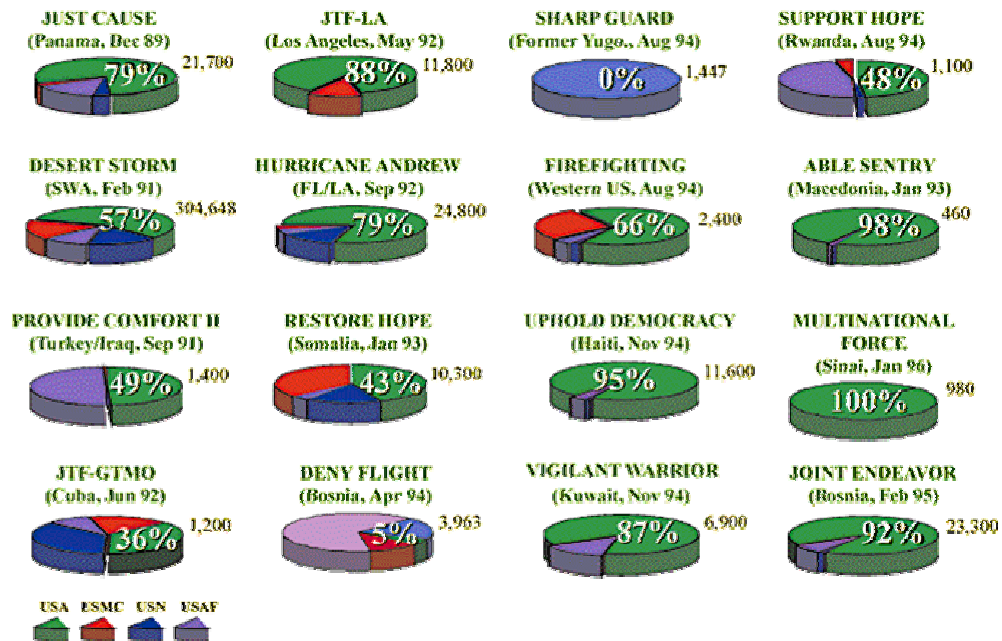
Source: Army Vision 2010

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Critical Rapid Reaction Parameters	Path 1: Enhancing Current Light forces	Path 2: Making Light Forces Smaller and More Dispersed	Path 3: Introducing Maneuver to Light Forces
Kind of mission (e.g. Peace ops., force entry, area defense, local attack)	No change in capability	Decrease in capability	Significant increase in capability
Type of environment (e.g. open, close, urban, contaminated)	No change in capability	No change in capability	Increase or decrease in capability
Level of threat (e.g. size, level of sophistication)	Increase in capability	No change in capability	Significant increase in capability
Kind of threat (e.g. militia, light infantry, mechanized, combined)	Increase in capability	Decrease in capability	Significant increase in capability
Responsiveness into theater (e.g. few days, weeks, few weeks	No change in capability	Significant increase in capability	Decrease in capability

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[283]Source: "Lightning Over Water: Sharpening America's Light Forces for Rapid Reaction Missions" publication by RAND

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ICV Infantry Carrier Vehicle

MGS Mobile Gun System

TGM Anti Tank Guided Missile

CV Commander's Vehicle

MC Mortar Carrier

RV Reconnaissance Vehicle

ESV Engineer Squad Vehicle

NBC RV NBC Reconnaissance Vehicle

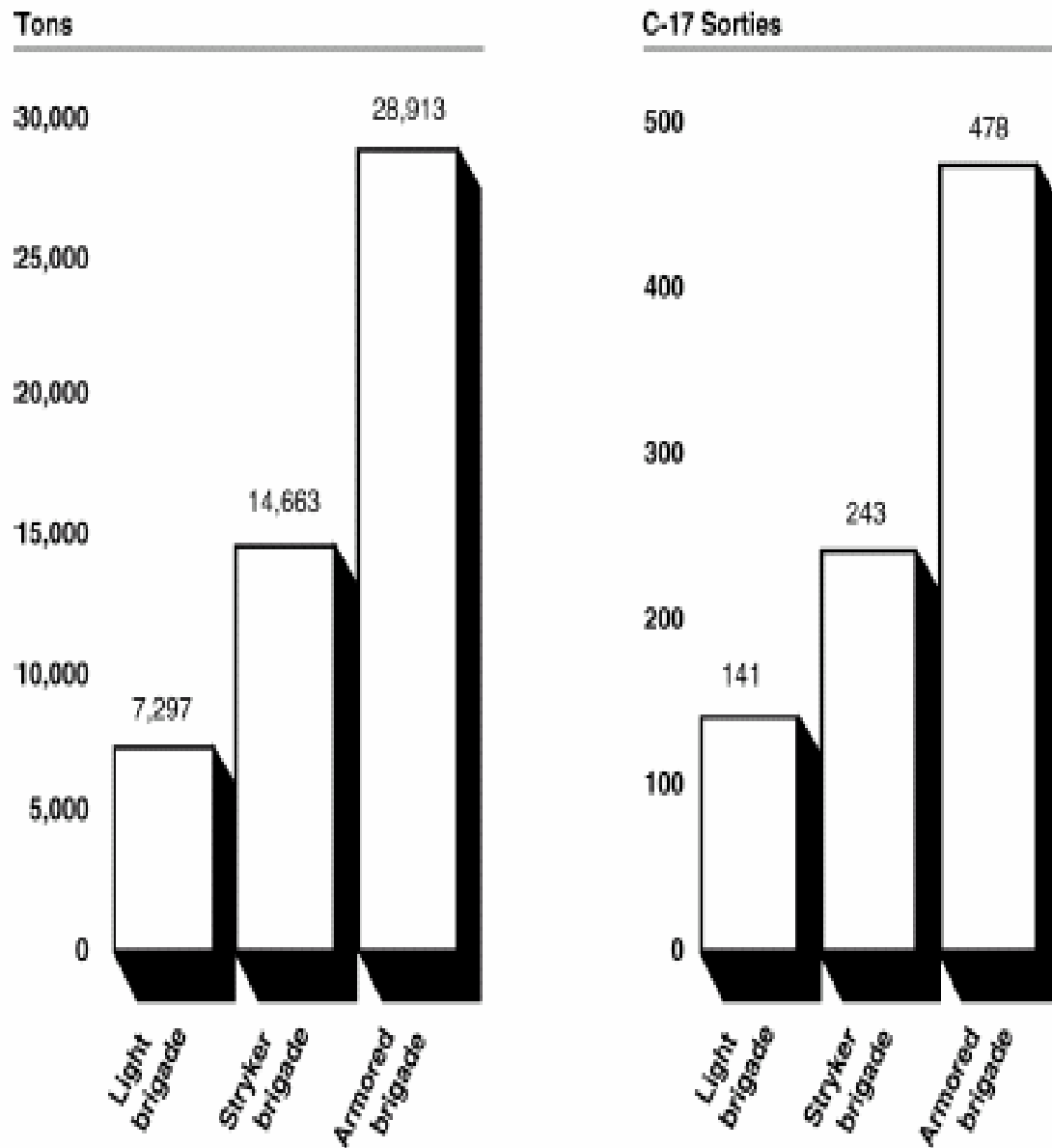EV Medical Evacuation Vehicle

FSV Fire Support Vehicle

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[284] Source: Analysis of the SBCT strategic sealift deployment options, Preston L. Gill

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Tons

C-17 Sorties
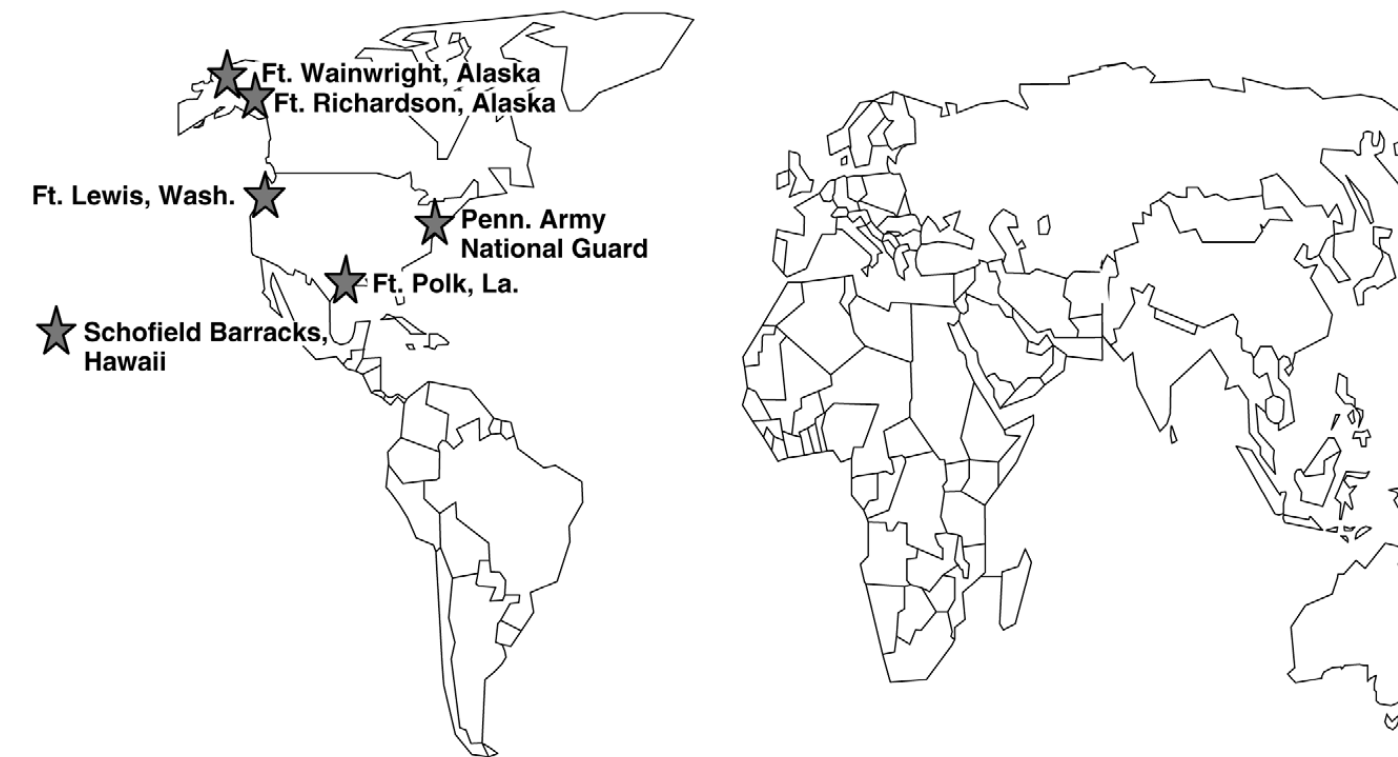
Source: GAO's analysis of U.S. Army and Military Traffic Management Command's, Transportation Engineering Agency data.

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APPENDIX B/5

Total Personnel
3614 pers.

SBCT BRIGADE Headquarters
121 pers.

INFANTRY BATTALION
3 x 691 pers.

- Stryker (3 x 65)
- JAVELIN (3 x 27)
- ATGM (3 x 9) (ILO=MGS)
- 120mm Mortars (3 x 10)
- 81mm Mortars (3 x 4)
- 60mm Mortars (3 x 6)
- M24 Sniper Rifle (3 x 5)

CAVALRY SQUADRON
(Reconnaissance, Surveillance & Target Acquisition)
428 pers.

- Stryker (53)
- JAVELIN (36)
- 120mm Mortars (6)
- Ground Radar (4)
- SHADOW UAV (3)
- PROPHET (3)
- FOX (3) (ILO=NBCRV)

ARTILLERY BATTALION
290 pers.

- M198 155T HOW (12)
- Q-36 Radar (1)
- Q-37 Radar (1)

SUPPORT BATTALION
388 pers.

- HEMMT-LHS (22)
- HEMMT Tankers (14)
- HEMMT-LHS (WATER) (6)
- Combat Repair Team (5)

MI COMPANY
67 pers.

- All Source Analysis System Remote Weapon Station (ASAS/RWS)
- IMETS-Light
- Common Ground Station/ Counter Intelligence Automated Tool Set (CGS/CHATS)
- CI&OPS WS

ENGINEER COMPANY
120 pers.

- Stryker ESV (9)
- JAVELIN (4)
- MICLIC (6)
- VOLCANO (3)
- High Mobility Engineer Excavator (HMEE) (6) (ILO=SEE)
- DEUCE (6)
- MGB (4) (ILO=REBS)

SIGNAL COMPANY
74 pers.

- Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T) (3)
- Trojan Spirit (3)
- Brigade Subscriber Node (BSN) (2) / BRSS (2)
- RETRANS (15)
- Enhanced Position Location Reporting System (EPLRS) NCS-E (3)
- EPLRS Gateway (2)
- Network Operations Vehicle (NOC-V) (1)

ANTI-TANK COMPANY
53 pers.

- Stryker (10)
- TOW II-B (9)

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Weapon	SBCT	Light Infantry
M-16/M-4	139	139
M203	18	18
M249	18	18
M240B	6	6
.50 cal MG	13	0
MK-19	6	0
9mm pistol	20	20
60mm	2	2
81mm	0	0
120mm	2	0
Javelin	9	3
SDM	9	0
Shot Gun	9	0
M-24	1	0
MGS	3	0

(SBCT MTOE 2002 and a Light Infantry Company MTOE 2002)

[286] Source: Is the SBCT a Viable Concept, Maj. Adam L. Rocke

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Type of equipment	Number
Tanks	**1005**
Leopard 2A4	128
T72	644
PT91	233
APCs	**1359**
BMP	1359
Artillery pieces (120mm +)	**1092**
Guns	652
Mortars	184
Multi rocket launchers	256
Helicopters	**170**
W3	36
Mi-8	29
Mi-17	6
Mi-2	56
Mi-24D	43
Armored bridges	**126**
BLG-67M2	126

NOTE: the table does not show equipment used by other services (ex. helicopters used by the Air Force)

MANPOWER OF ARMED FORCES IN 2004[288]

Professional Soldiers	84.837
Conscripts	63.004
Total	147.841

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[287] Source: Polish MOD site www.mon.gov and report from Parliamentary Defense Commission meeting 09 July 2003

[288] Source: Presentation made by Armed Forces Financial Department – February 2004 (published on www.mon.gov)

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APPENDIX C/2: Organizational Structure of the Polish 2nd Corps
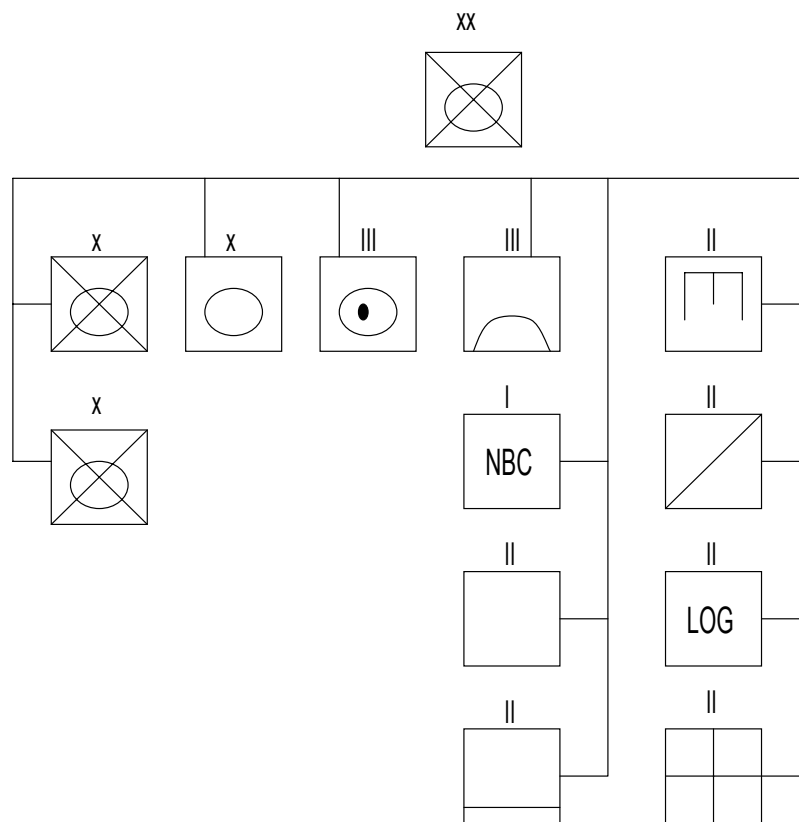
(source: www.2kz.mil.pl)
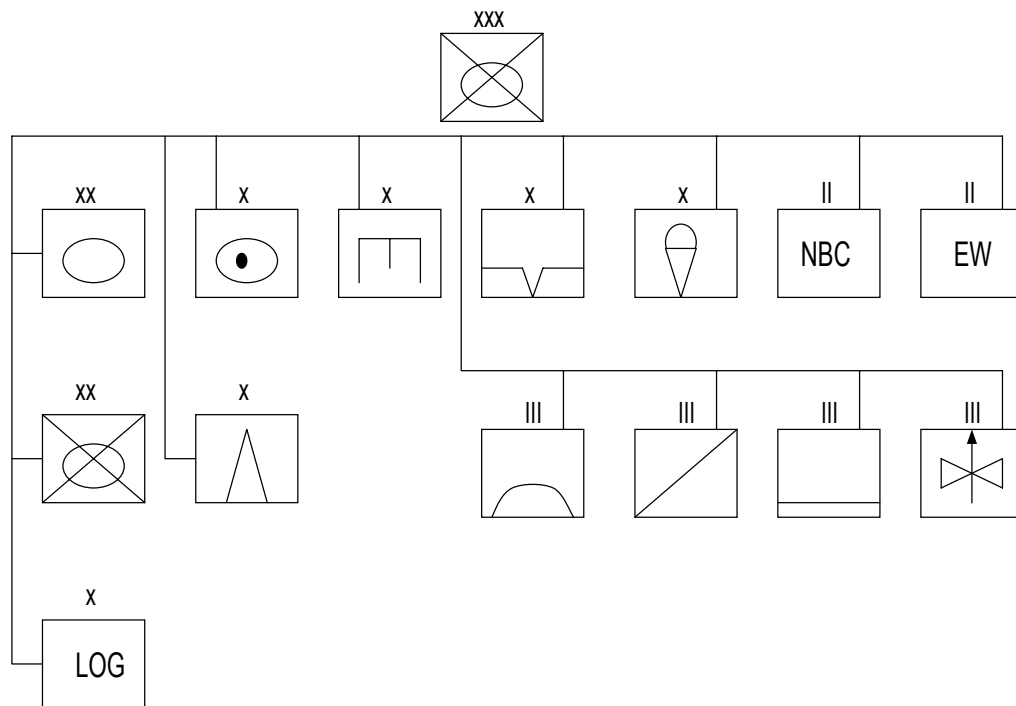
Note: structure of the 1st Corps does not include the airborne and the air assault brigades, it also has two mechanized instead of one mechanized and one armor divisions.

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APPENDIX C/3.1: Organizational Structure of Polish Mechanized Division
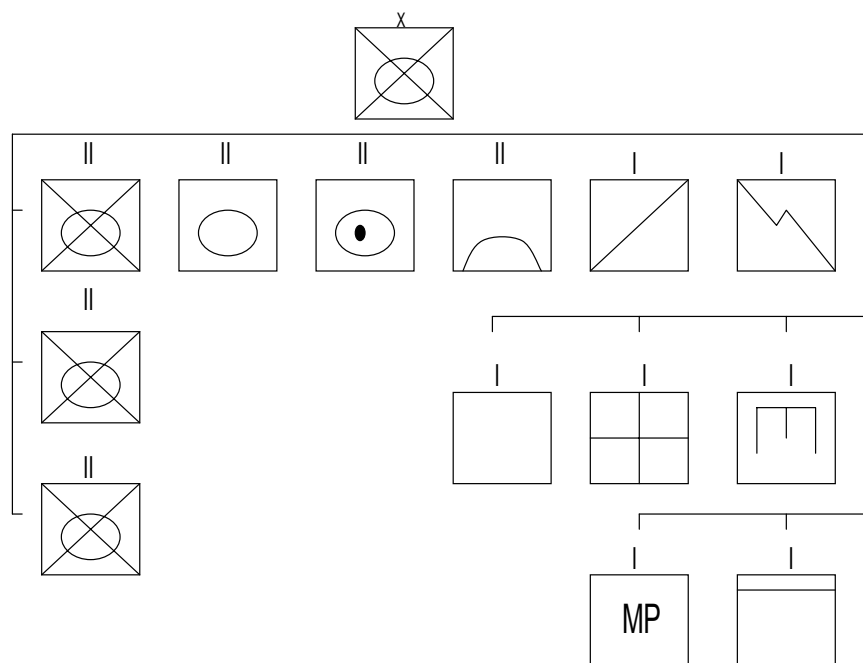
(source: author's personal experience)

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APPENDIX C/3.3: Organizational Structure of Polish Mechanized Brigade

(source: author's personal experience)

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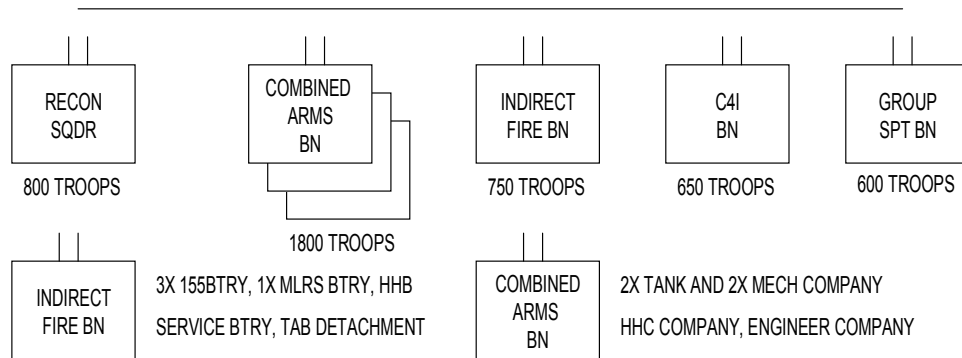| SOURCE	AMOUNT (million Złoty)
MOD budget	16.003,3
Defense related spending of other ministries	42,7
National reserve defense spending (F16 program financing and salaries for soldiers being deployed abroad)	352,5
Defense research spending (paid by Ministry of Science)	145,7
Attaché and military diplomatic missions (paid by Ministry of Foreign Affairs)	33,0
University students' military training (paid by Ministry of Education)	5,7
Military Housing Agency spending	62,0
Special reserve of the MOD	75,4
Profit from privatization of the defense industry	30,8
TOTAL	**16.751,1**

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[289] Source: Presentation made by Armed Forces Financial Department – February 2004 (published on www.mon.gov)
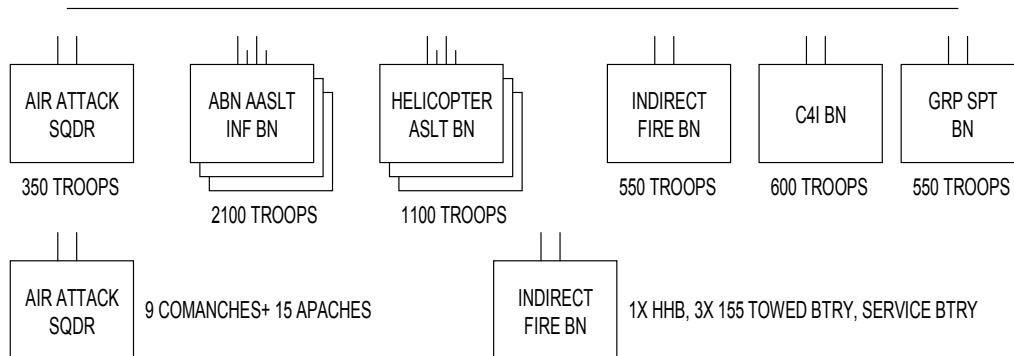
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APPENDIX D/1.1 STRUCTURES OF BATTLE GROUPS AS PROPOSED BY LTC MACGREGOR

HEAVY COMBAT GROUP

RECON SQDR	COMBINED ARMS BN	INDIRECT FIRE BN	C4I BN	GROUP SPT BN
800 TROOPS	1800 TROOPS	750 TROOPS	650 TROOPS	600 TROOPS

INDIRECT FIRE BN	3X 155BTRY, 1X MLRS BTRY, HHB SERVICE BTRY, TAB DETACHMENT

COMBINED ARMS BN	2X TANK AND 2X MECH COMPANY HHC COMPANY, ENGINEER COMPANY

AIRBORNE – AIR ASSAULT GROUP

AIR ATTACK SQDR	ABN AASLT INF BN	HELICOPTER ASLT BN	INDIRECT FIRE BN	C4I BN	GRP SPT BN
350 TROOPS	2100 TROOPS	1100 TROOPS	550 TROOPS	600 TROOPS	550 TROOPS

AIR ATTACK SQDR	9 COMANCHES+ 15 APACHES

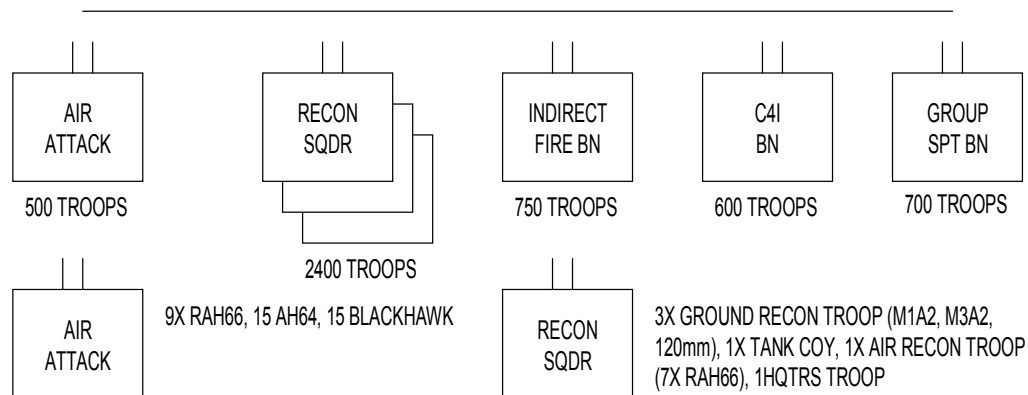| INDIRECT FIRE BN	1X HHB, 3X 155 TOWED BTRY, SERVICE BTRY

SOURCE: „BREAKING THE PHALANX" LTC MACGREGOR

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APPENDIX D/1.2 STRUCTURES OF BATTLE GROUPS AS PROPOSED BY LTC MACGREGOR

HEAVY RECON STRIKE GROUP

AIR ATTACK	RECON SQDR	INDIRECT FIRE BN	C4I BN	GROUP SPT BN
500 TROOPS	2400 TROOPS	750 TROOPS	600 TROOPS	700 TROOPS

AIR ATTACK

9X RAH66, 15 AH64, 15 BLACKHAWK

RECON SQDR — 3X GROUND RECON TROOP (M1A2, M3A2, 120mm), 1X TANK COY, 1X AIR RECON TROOP (7X RAH66), 1HQTRS TROOP

LIGHT RECON STRIKE GROUP

AIR ATTACK SQDR	RECON SQDR	ENG MOBILITY BN	C4I BN	GRP SPT BN
500 TROOPS	2400 TROOPS	550 TROOPS	700 TROOPS	700 TROOPS

INCLUDES MLRS BTRY AND TAB DETACHMENT

AIR ATTACK SQDR — 9 RAH66 + 25 UH60 equipped as flying batteries

RECON SQDR — 3X GROUND RECON TROOP (AGS, LAV, 120mm), 1X TANK COY (AGS), 1X AIR RECON TROOP (7RAH66), 1X HQTRS TROOP

SOURCE: „BREAKING THE PHALANX" LTC MACGREGOR

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APPENDIX D/2

APPENDIX D/2 STRUCTURE OF C4I BN AS PROPOSED BY LTC MACGREGOR

•**GROUP SUPPORT HEADQUARTERS COMPANY** (INCLUDES AG COMPONENT, MEDICAL AND SUPPORTING MAINTENANCE ASSETS),

•**NON LINE OF SIGHT BATTERY** INCLUDES UAVS AND OVER THE HORIZON ATTACK SYSTEMS,

•**INFORMATION WARFARE COMPANY** INCLUDES INTEL COLLECTION, JAMMING ANALYSIS, CHEMICAL DETECTION CAPABILITY

•**AIR DEFENSE BATTERY** SHORT RANGE TACTICAL AD SYSTEMS

•**COMMAND AND CONTROL COMPANY** COMMUNICATION DESIGNED TO SUPPORT DISPERSED, HIGHLY MOBILE COMBAT GROUP

•**CHEMICAL COMPANY** INCLUDES CHEMICAL RECON AND LIMITED DECONTAMINATION CAPABILITY

•**MILITARY POLICE SECURITY DETACHMENT** INCLUDES SUFFICIENT MANPOWER AND FIREPOWER TO PROVIDE SECURITY FOR C2 NODES AND SUSTAINMENT OPERATIONS

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APPENDIX D/3.1

<u>AIRBORNE/ AIRMOBILE GROUP</u>

## STRUCTURE BASING ON MACGREGOR'S AIRBORNE/ AIR ASSAULT GROUP

XX

18X armed W3

6X MI 24

C4 I

SPT GROUP

14 CARS, 9 MEDAVAC HELICOPTERS

TRANSPORT HELICOPTER UNITS DETACHED FROM ARMY AVIATION GROUP

3X AIRBORNE/ AIRMOBILE INF COMPANY, 1XSUPPORT COMPANY
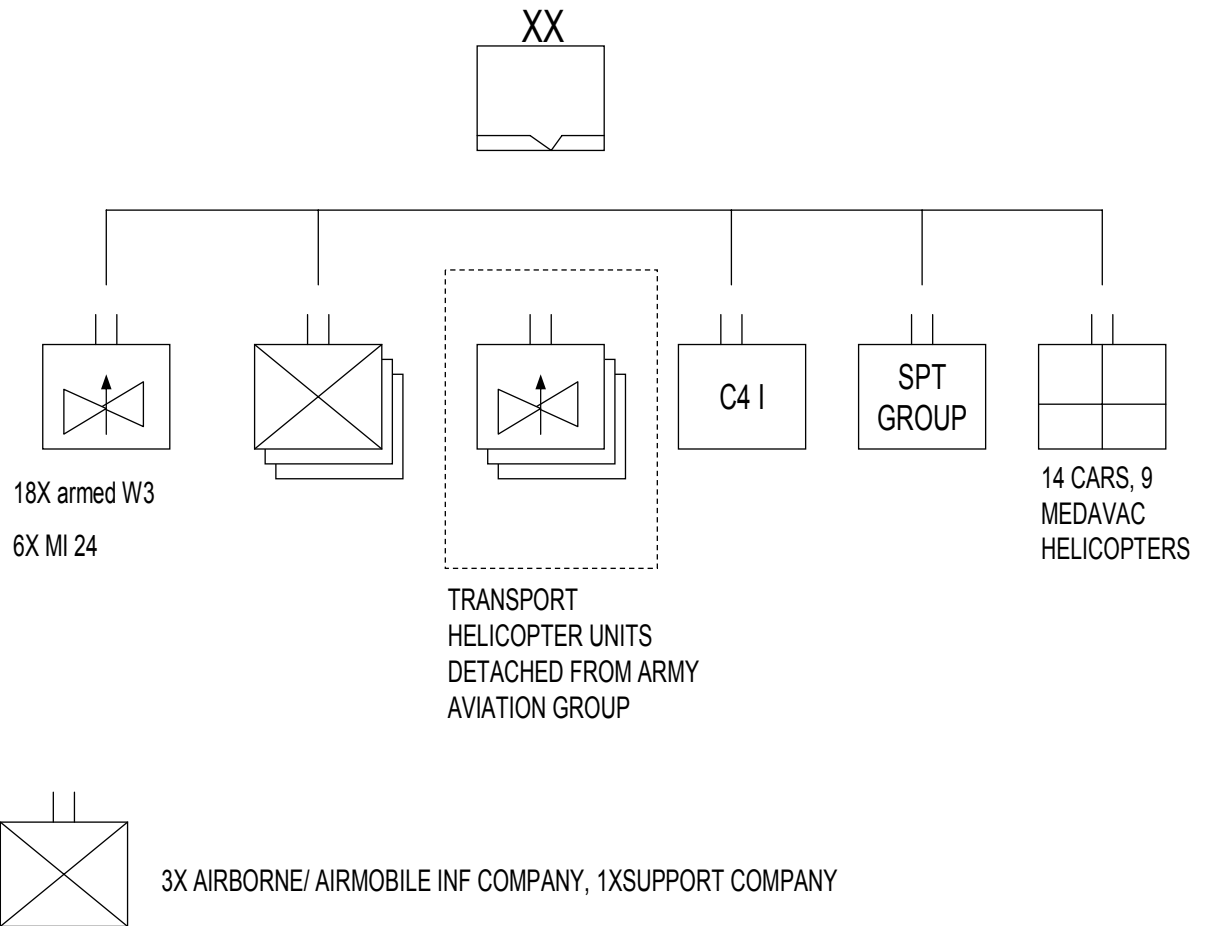
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APPENDIX D/3.2

MEDIUM BATTLE GROUP

STRUCTURE BASING ON MACGREGOR'S LIGHT RECON STRIKE GROUP
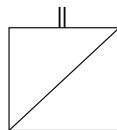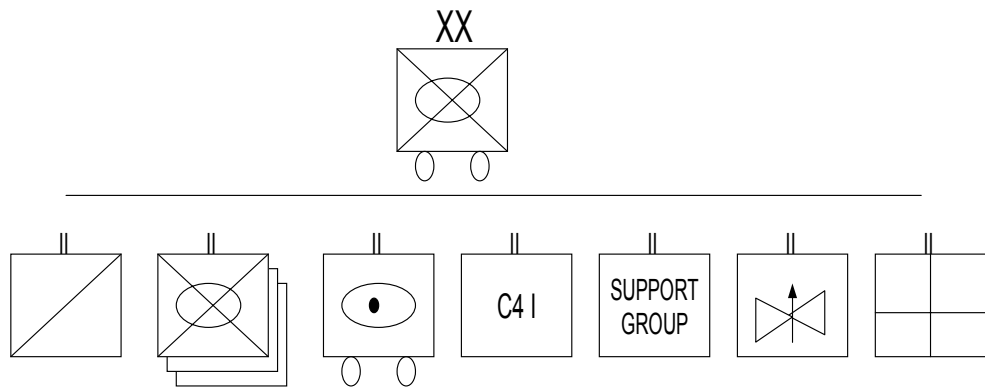
2X ARMED RECON TROOP (4x AGS + 10x wheeled APC each), 1X light troop (cars + motorcycles)
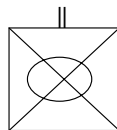
3X INF COMPANY (10x wheeled APC + 4x AGS each), ENG COMPANY, HHC COMPANY (AT platoon, mortars)
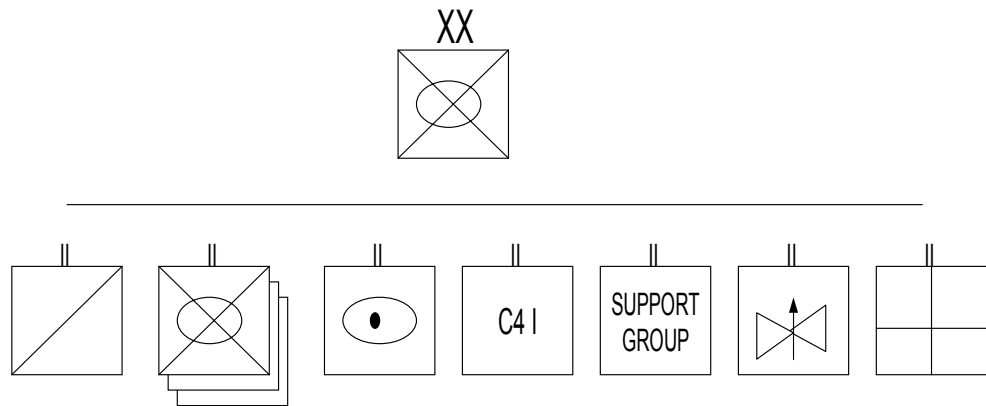
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APPENDIX D/3.3

APPENDIX D/3.3

HEAVY BATTLE GROUP

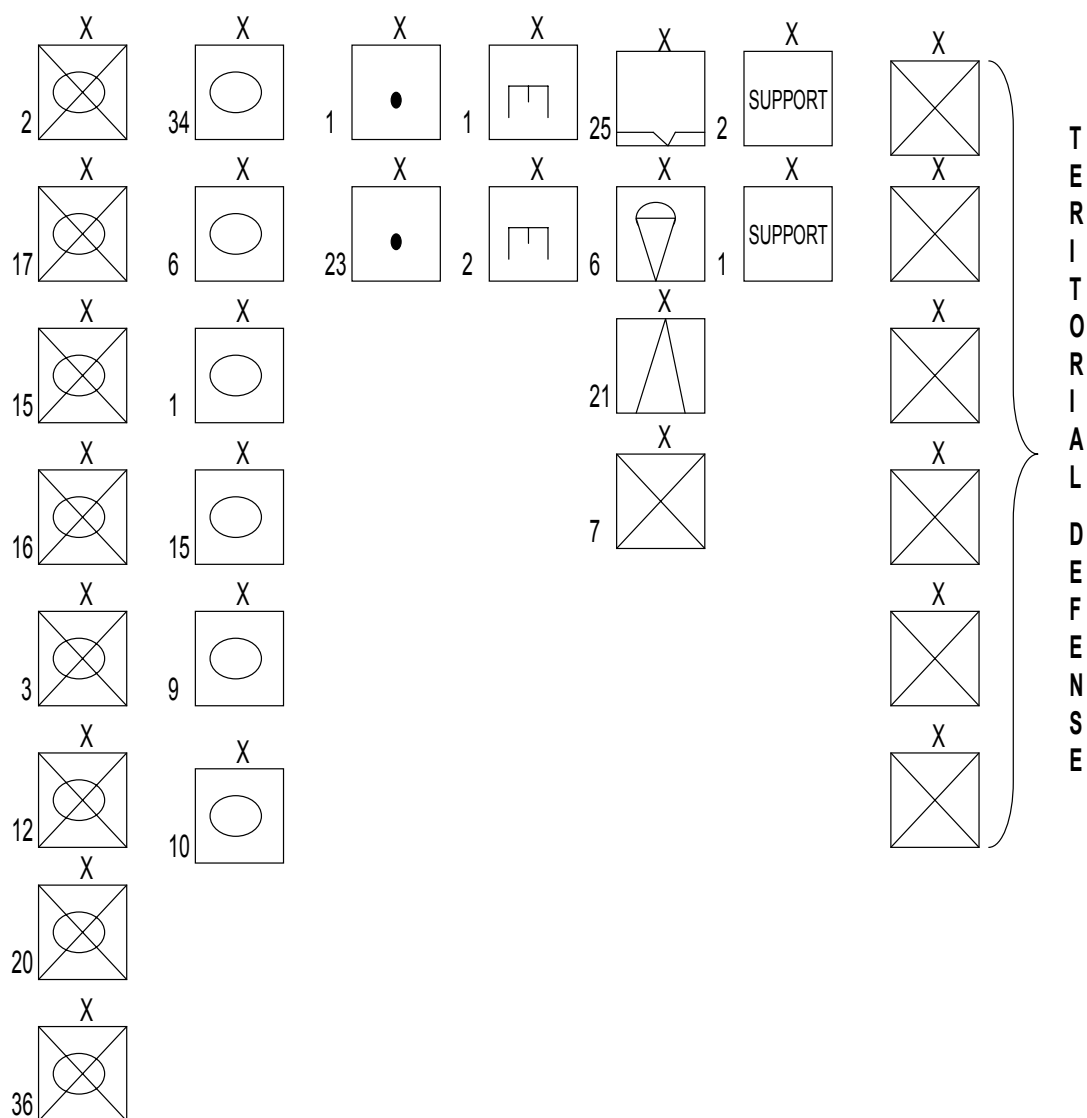**STRUCTURE BASING ON MACGREGOR'S HEAVY RECON STRIKE GROUP**

XX

SUPPORT GROUP

C4 I

2X ARMED RECON TROOP (4x TANK + 10x APC), 1X light troop (cars + motorcycles)

3X INF COMPANY (10x APC + 4x TANK each), ENG COMPANY, HHC COMPANY (mortars)
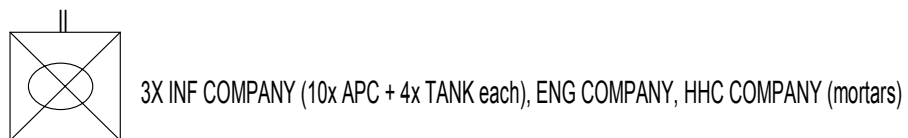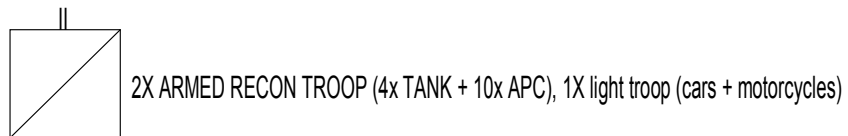
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APPENDIX D/4

BRIGADES OF POLISH LAND FORCES

135

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LIST OF REFERENCES

1) Von Clausewitz, Carl, *On War*, (Princeton University Press 1989).

2) Army Vision 2010, www.army.mil/2010/ (Accessed 09.11.2004).

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4) Macgregor, Douglas, A., *Breaking the Phalanx, New Design For Landpower,* (Center for Strategic and International Studies, 1997).

5) Vick, Alan, Orletsky, David, Pirnie, Bruce, Seth, Jones, *The Stryker Brigade Combat Team*, http://library.nps.navy.mil/Archimages/5169.PDF (Accessed 10.09.2004).

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