THE ROLE OF THE MILITARY CONSTRUCTION ENGINEERS IN THE HYBRID WAR

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

SEMMING G. RUSTEN, MAJOR, NORWEGIAN ARMY
B.S., Norwegian Military Academy, Oslo, Norway, 2007

Fort Leavenworth, Kansas
2015

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
12-06-2015	Master's Thesis	AUG 2014 – JUN 2015

4. TITLE AND SUBTITLE

The Role of the Military Construction Engineers in the Hybrid War

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Major, Seeming Grottland Rusten

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORG REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The NATO military construction engineers have historically played a critical role in shaping the operational environment. This role includes developing infrastructure in the host nation, in order to establish a lasting peace. Changes in the international security environment entail consequences for the military engineers. The construction engineers in the hybrid war will be faced with a more complex operational environment. To establish a qualitative pace it is essential to mitigate the gap, or erase the border between military and non-military actors. Military construction engineers will be crucial in shaping the hybrid environment and when developing the civil-military relationship. The NATO military construction engineers are in a position to take on this challenge.

15. SUBJECT TERMS

Construction Engineers, NATO, Hybrid War

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			**19b. PHONE NUMBER** *(include area code)*
(U)	(U)	(U)	(U)	85	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: Major Semming Grottland Rusten

Thesis Title: The Role of the Military Construction Engineers in the Hybrid War

Approved by:

_____, Thesis Committee Chair
Jonathan M. Williams, M.A.

_____, Member
Kenneth E. Long, D.M.

_____, Member
Patrick C. Beatty, M.A.

Accepted this 12th day of June 2015 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

THE ROLE OF THE MILITARY CONSTRUCTION ENGINEERS IN THE HYBRID WAR, by Major Semming G. Rusten, 85 pages.

The NATO military construction engineers have historically played a critical role in shaping the operational environment. This role includes developing infrastructure in the host nation, in order to establish a lasting peace. Changes in the international security environment entail consequences for the military engineers. The construction engineers in the hybrid war will be faced with a more complex operational environment. To establish a qualitative pace it is essential to mitigate the gap, or erase the border between military and non-military actors. Military construction engineers will be crucial in shaping the hybrid environment and when developing the civil-military relationship. The NATO military construction engineers are in a position to take on this challenge.

ACKNOWLEDGMENTS

I would like to thank my thesis advisors, Mr. Jonathan M. Williams, Dr. Kenneth E. Long and Mr. Patrick Beatty. Your guidance and advice helped me gain a deeper understanding of the engineer's role in a complex operation environment. You also provided critical, but constructive comments along the way.

In addition I would like to sincerely thank my loving and patient wife Hege. You always support and help me, and I could not have done this without you. Our sons Vetle and Sigurd have also been very supportive throughout the year.

TABLE OF CONTENTS

Page

ACRONYMS

4GW	4th Generation Warfare
ACT	Allied Command Transformation
AJP	Allied Joint Publication
ATP	Army Techniques Publication
AUTL	Army Universal Task List
CBA	Capabilities-Based Assessment
CGSC	Command and General Staff College
CIMIC	Civil-Military Co-operation
CMO	Civil-military Operations
COIN	Counterinsurgency
DIME	Diplomatic, Informational, Military, Economic
DOTML-PF	Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, and Facilities
ENTEC	Euro NATO Training Engineer Center
EUCOM	European Command
EUD	Europe Division
FAA	Functional Area Analysis
FFI	Norwegian Defence Research Establishment
FM	Field Manual
FNA	Functional Needs Analysis
FSA	Functional Solution Analysis
HQ	Head Quarter
ICISS	International Commission on Intervention and State Sovereignty

IDF	Israeli Defense Force
IED	Improvised Explosive Devise
ISAF	International Stabilization Force
JCIDS	Joint Capabilities Integration Development System
JP	Joint Publication
LOC	Lines of Communication
MOOTW	Military Operations Other Than War
NA5CRO	Non-Article 5 Crisis Response Operations
NATO	North Atlantic Treaty Organization
NGO	Nongovernmental Organization
PRT	Provincial Reconstruction Team
S/CRS	State Department's Office of the Coordinator for Reconstruction and Stabilization
TCC	Troop Contributing Countries
TRADOC	Training and Doctrine Command
UN	United Nations
USAID	United States Agency for International Development
USJFCOM	United States Joint Forces Command

ILLUSTRATIONS

Page

TABLES

Page

CHAPTER 1

INTRODUCTION

According to an article by Dr Julian French, in the Daily Journal, Russia will have invested 700 billion USD in its armed forces by 2020.[1] They have recently demonstrated the ability to use their forces in new and effective ways: undeclared war, massive propaganda, cyber attacks, disinformation and covert military infiltration. In the spring of 2014, thousands of heavily armed Russian soldiers stormed into the Crimea, wearing uniforms without national identification. These were the famous "Little green men," that Putin would have us to believe were Russian volunteers. Shortly after, the peninsula was incorporated into Russia. Today, a Russian military engineer brigade is supporting the Russian "so-called" humanitarian aid operation, and they are also reconstructing infrastructure. The Western world and NATO are sanctioning and condemning the Russians, but it has had little or no effect. What we see now is a mixture of medieval barbarism and modern ways of war; it meets the definition of an unrestricted hybrid war. Hybrid war is a combination between conventional and irregular warfare.

Background

Military engineers have been used on the battlefield throughout history. Ancient Rome's armed forces had dedicated units for camp construction, bridge building, and road construction. During the 17th Century, French forces used dedicated soldiers to dig trenches and tunnels to approach the walls of besieged forts. These trenches and tunnels

[1] Julian French, "Time to Face Reality: The World's Rapidly Shifting Military Balance," *Daily Journal*, accessed 14 May 2015, http://thedailyjournalist.com/thethinker/time-to-face-reality-the-world-s-rapidly-shifting-military-balance/.

were called saps, and the diggers were called sappers. “Sapper” is by definition a military engineer, and according to Encyclopedia Britannica the name is derived from the French word *sappe* (“spadework,” or “trench”).

In Norway, the need for military engineers led to the establishment of the Military Academy on 6th December 1750. The Norwegian Armed Forces had identified a competence gap within areas of fortification and trajectory calculation for indirect fire.

Although use of military engineers in support of military maneuver units is nothing new, the way the engineers contribute has changed.

In conventional warfare, concentrating the available effects of overwhelming combat power in offensive operations, or massing all the available effects of overwhelming combat power for defensive operations traditionally achieves victory. Engineer forces breach enemy obstacles, clear routes, construct tactical and protective obstacles, build fortifications, and construct fighting positions. All activities are directly related to, and supportive of, the decisive commitment of combat power.[2]

Since the fall of the Berlin Wall in 1989, when the Soviet Union was dissolved, conventional warfare has been regarded as more or less irrelevant by many observers. The last decade of war fighting in Iraq and Afghanistan has further influenced the trend to focus on non-conventional and counterinsurgency (COIN) warfare. In COIN operations, control of the population is the main objective. Separating the insurgents and irregular forces from the rest of the population is crucial. When conducting COIN operations, the army is vulnerable to conventional attack, when it disperses to deal with

[2] United States Army, Field Manual (FM) 5-71-100, *Division Engineer Combat Operations* (Washington, DC: Government Printing Office, 1993).

the enemy's irregular forces. When an army keeps its forces concentrated, it cedes control of the operational environment and the population to the enemy.[3] The operational environment in COIN operations results in additional tasks for the engineers. Economic development and establishing of infrastructure are frequently featured as the main nonlethal lines of effort in recent COIN operations.[4] Engineers have the competence and capacity to contribute to winning the hearts and minds of the host nation population. The U.S. and its allies have attempted to indirectly fight insurgents by conducting reconstruction operations, establishing infrastructure, and mentoring host nation forces. Provincial Reconstruction Teams were established throughout Afghanistan in 2002.

Western military forces have delivered some spectacular tactical wins the last 20 years, and military engineers have played a central role, but these victories have not correspondingly led to lasting strategic gains in accordance with the initial political goals. Retired Lieutenant General Daniel Bolger states that we lost the wars both in Afghanistan and Iraq.[5] He is also critical to the use of military assets to conduct reconstruction. He represents a traditionally view where the use of military force is justified by the purpose of thwarting security threats or conquering foreign territories, and rebuilding is not part of the responsibility. This view is highly debated in today's security environment, and there exists several initiatives to establish the link between the "pre-" and the "(post-) conflict"

[3] Williamson Murray and Peter R. Mansoor, eds., *Hybrid Warfare: Fighting Complex Opponents from the Ancient World to the Present* (New York: Cambridge University Press, 2012).

[4] Joint Chiefs of Staff, Joint Publication (JP) 3-34, *Joint Engineer Operations* (Washington, DC: Joint Chiefs of Staff, 2013).

[5] Daniel P. Bolger, *Why We Lost: A General's Inside Account of the Iraq and Afghanistan Wars* (New York: Houghton Mifflin Harcourt, 2014).

phase. The International Commission on Intervention and State Sovereignty (ICISS) developed the report *The Responsibility to Protect,* in 2001. This report suggests a concept of responsibility to rebuild, following an intervention. It also argues that modern interventions cannot end after the cessation of military activities, but will require ongoing engagement to prevent further conflict.[6]

The same responsibility was also addressed in the UN High-Level Panel Report on Threats, Challenges, and Change in 2004[7] and in the report by the UN Secretary-General In Larger Freedom: Towards Development, Security and Human Rights for All,[8] from 2005. The Outcome Document of the 2005 Word Summit[9] lays down principles concerning the meaning and scope of the international "responsibility to protect." The three substantive components of responsibility to protect are defined as the responsibility to prevent, the responsibility to react, and the responsibility to rebuild,[10] The UN Secretary-General emphasized a similar link and military responsibility in his report, The

---

[6] Report of the International Commission on Intervention and State Sovereignty (ICISS), *The Responsibility to Protect*, December 2001, paragraph. 5.1, accessed 15 May 2015, http://responsibilitytoprotect.org/ICISS%20Report.pdf.

[7] Report of the UN High-level Panel on Threats, *Challenges, and Change, A More Secure World: Our Shared Responsibility*, 2004, paragraphs 201-203, accessed 14 May 2015, http://www.un.org/en/peacebuilding/pdf/historical/hlp_more_secure_world.pdf.

[8] Secretary-General, In Larger Freedom, Towards Development, Security and Human Rights for All, 21 March 2005, paragraph. 135. The UN Secretary-General emphasized a similar need in his report, The Rule of Law and Transitional Justice in Conflict and Post-conflict Societies, 23 August 2004, paragraph. 2.

[9] UN General Assembly, *2005 World Summit Outcome*, GA Res 60/1, 60th Sess. A/RES/60/1 (2005), para. 138 and 139.

[10] Carsten Stahn, "Responsibility to Protect: Political Rhetoric or Emerging Legal Norm?," *The American Journal of International Law* 101, no. 1 (January 2007): 120.

Rule of Law and Transitional Justice in Conflict and Post-conflict Societies.[11] All these documents indicate an existing link between the use of force and the responsibility to restore a qualitative lasting peace.

Even though it is impossible to precisely predict the future operation environment, NATO must prepare for the next conflict. The history has provided reasons to believe that future warfare will consist of elements from the last war, in addition to new challenges and opportunities. Few, if any, militaries in the world can match the U.S. military and its allies using conventional warfare. It is inevitable that nations or non-state adversaries will prefer a type of warfare that will favor their capacities and resources. The Second Lebanon War in 2006, between the Israel Defense Forces (IDF) and Hezbollah, showed the world (and the Israeli military), the effectiveness of hybrid war against a stronger and superior force. Hezbollah, with 3,000 troops, was able to humiliate the IDF who had more than 30,000 troops. The hybrid threat is a combination of regular and irregular forces, with the inclusion of criminal elements. A hybrid force will use conventional warfare capabilities to win symmetric battles at decisive points. They will dissolve into the population, and continue with asymmetric tactics. In addition to symmetric and asymmetric operations, criminal activities will pose a threat. Hybrid warfare will be fought by all available instruments of power.

In 1999, two Chinese Colonels, Qiao and Wang, published a book that in English translation was called *Unrestricted Warfare.* The book's theme was how China could withstand the technologically superior U.S. The authors claimed that all means that could

[11] GA Res. 60/1, supra note 51, paragraphs 97-105. For a survey see Stahn, "Institutionalizing Brahimi's 'Light Footprint': A Comment on the Role and Mandate of the Peacebuilding Commission," 403.

be used in war must be used. They developed a matrix of military, quasi-military, and non-military means, and described how these instruments could be exploited in a virtually inexhaustible number of combinations.

Today, Russia is combining a humanitarian aid operation with information operations and a covert deployment of Special Forces in Ukraine. According to Russian state-controlled media, Putin has proposed a seven-point cease-fire plan that calls for a creation of "humanitarian corridors." The plan allows aid and Russian reconstruction teams to reach the separatists. This Russian example shows how engineers might be used in a modern hybrid war.

Hybrid war is not a new type of war, as we have seen elements of hybrid war in the way the Provisional Irish Republican Army, Hezbollah, Al-Qaida, and the Islamic State have conducted their operations. The use of military, quasi-military, and non-military means, in order to achieve one common endstate, provides the Western world a glimpse of a possible future threat scenario.

By relying on historical experience with counter insurgency operations, there is little doubt that the closest possible integration of civilian and military instruments is sensible. In the quest for successful strategies, R. Scott Moore at the Center for Complex Operations in Washington has conducted a comparative analysis of 100 irregular operations from 1916 to the present day. His findings indicate that strategies primarily intended to fight the enemy, failed or led to oppression and occupation. Strategies that

integrated political, social, economic, and security-related measures, and simultaneously addressed the underlying issues and beliefs, usually ended up with long-term stability.[12]

If the Western way of war is inadequate when handling the complexity of COIN operations, it is unlikely that it will be able to cope with the even more complex battlefield of the hybrid war.

As former Secretary of Defense Robert M. Gates noted in 2008: "We are not going to kill or capture our way to victory."

Research Questions

Primary Question

How will military engineering units contribute to the defeat of the future threats in hybrid warfare?

Secondary Questions

1. How will the hybrid threat change current NATO doctrine for Construction Engineers?
2. How will the hybrid threat affect changes in the Army Construction Engineers organization?
3. How will the hybrid threat change training of Army Construction Engineers?
4. How will the hybrid threat impact leadership and education of Army Construction Engineers?

[12] Scott R. Moore, *Reexamining Complex Operations* (Washington, DC: Center for Complex Operations, 2009).

Assumptions

"While we cannot predict the future of our increasingly uncertain and complex strategic environment, we can be certain that our Nation will continue to call on America's Army." This statement by General Raymond T. Odierno, written in the foreword of ADP 1 *The Army*, is as valid for NATO as for the U.S. Army.

After more than a decade of COIN operations in Afghanistan, it is a growing recognition that there is not a solely military solution to the challenges, just as there is not an autonomous civil solution. The recognition is consequently the need for closer civilian-military cooperation, where safety as well as societal challenges is seen as a whole, and meet with coordinated civil-military measures.

Hybrid warfare will consist of both conventional and nonconventional operations. It will still be essential for the military forces to create a safe and secure environment, so Non Governmental Organizations (NGOs) can inherit the responsibility for the reconstruction phase. Experiences from the last decade of war in Afghanistan and from the Provincial Reconstruction Teams will be relevant in planning how to face hybrid threats.

Even though the conflict in Afghanistan is not over, and the consequences of using civil contractors have not yet been fully evaluated. It is an assumption that contractors and NGOs will play an important role in post conflict reconstruction in the future.

The question of to what extent the military force is responsible for construction and reconstruction in a conflict scenario is highly debated within the just war theory. In this thesis an assumption has been made that the military force is responsible for

facilitating the other instruments of national power, Diplomatic, Informational, Military, Economic (DIME). The military construction engineers will therefore continue to play a crucial role in mitigating the gap between the tactical and the strategic level, and the military and the civil actors in the future operation environment.

Definition of Terms

Allied Command Transformation (ACT): ACT is one of two Strategic Commands in NATO; it was created as part of a reorganization of NATO's Command Structure in 2002. ACT promotes and leads initiatives designed to transform NATO's military structure, its forces, capabilities and doctrine.[13] To establish a linkage between U.S. and NATO transformation and development, the ACT was collocated with the United States Joint Forces Command in Norfolk Virginia. After the disestablishing of USJFCOM in 2011, ACT is still located at same place and are still maintaining and strengthening the transatlantic link. NATO's multinational doctrine is based upon contributions from American doctrine, and U.S. is relying on NATO doctrine when participating in NATO operations.

Capability Based Assessment (CBA): The analysis portion of the JCIDS process. The CBA provides recommendations to pursue a material or non-material solution to an identified capability gap that meets an established capability need. The analysis contains the Functional Area Analysis (FAA), Functional Needs Analysis (FNA) and Functional Solution Analysis (FSA).

[13] Allied Command Transformation, "Information Brochure," accessed 12 April 2015, www.act.nato.int.

Capability Gap: The inability to execute a specific course of action. The gap may be the result of a no existing capability, lack of proficiency or sufficiency in an existing capability solution, or the need to replace an existing capability solution to prevent a future gap.[14]

Civil-Military Co-operation (CIMIC): The coordination and cooperation, in support of the mission, between the NATO Commander and civil actors, including national population and local authorities, as well as international, national and non-governmental organizations and agencies.[15]

Civil-Military Operations (CMO): Key operations related to COIN, consist of information operations, military information support operations, maritime security operations, and counterdrug operations, among others.

Counterinsurgency (COIN): A comprehensive civilian and military effort designed to simultaneously defeat and contain an insurgency and address its root causes.

General Engineering: The engineer discipline that is focused on affecting terrain while not in close support to maneuver forces. Tasks that are most frequently performed under general engineering conditions include the construction, repair, maintenance, and operation of infrastructure, facilities, Lines of Communications (LOC), and bases; protection of natural and cultural resources; terrain modification and repair; selected

[14] Ibid., GL-5.

[15] North Atlantic Treaty Organization, Allied Joint Publication (AJP) 3.4.9, *Allied Joint Doctrine for Civil-Military Cooperation* (NATO Standardization Agency (NSA), 8 February 2013), accessed 14 May 2015, http://www.cimic-coe.org/wp-content/uploads/2014/06/AJP-3.4.9-EDA-V1-E1.pdf.

explosive hazard activities; and environmental activities. These are the primary focus for general engineer units.

Hybrid Threats: The North Atlantic Treaty Organization (NATO) defines hybrid threats as those "posed by any current or potential adversary, including state, non-state, and terrorists, with the ability, whether demonstrated or likely, to simultaneously employ conventional and non-convectional means adaptively in pursuit of their objectives."[16] A visualization of how hybrid threats consist of all elements from convectional to irregular capabilities is depicted in the following figure.

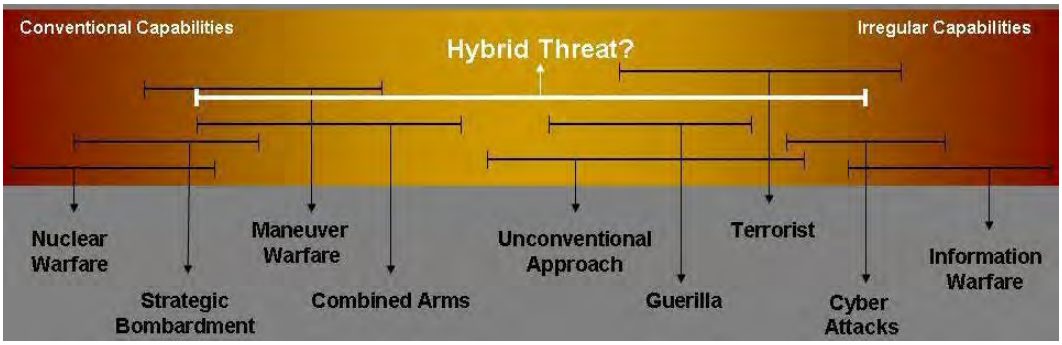

Figure 1. Hybrid Threat

Source: Created by author.

Hybrid War: The term "hybrid warfare" is defined by many students of warfare with varying perspectives on both the history and future of warfare. Some other terms closely aligned with hybrid warfare include irregular warfare, compound warfare, guerrilla warfare, unconventional warfare, covert, terrorism, unrestricted warfare,

[16] Government Accountability Office, GAO-10-1036R, *Hybrid Warfare* (Washington, DC: Government Accountability Office, 2010), 15.

ambiguous warfare, narco-terrorism, hybrid threat, asymmetric warfare, surrogate warfare, 4GW, political warfare, insurgency, proxy war, shadow war, Four Block War, and others. A common definition of hybrid warfare is "a combination of regular forces, irregular forces, criminal elements, political organizations, and/or terrorists that blend (and blur) traditional and non-traditional styles of warfare. Any or all of the mentioned types of forces could be engaged in hybrid warfare."

Joint Capabilities Integration and Development System (JCIDS): The process used by the Joint Requirements Oversight Council (JROC) to fulfill its advisory responsibilities to the Chairman of the Joint Chiefs of Staff in identifying, assessing, validating, and prioritizing joint military capability requirements.[17]

MILENG: Is the Engineer activity, undertaken regardless of component or service, to shape the physical operating environment.[18]

Mission Command: A commander's responsibility for mission accomplishment is total, but delegation of authority to subordinates and their responsibility to act in support of the higher commander's intentions are included in the principles of decentralization. Through mission command, commanders generate the freedom of action for subordinates to act purposefully when unforeseen developments arise, and exploit favorable opportunities.[19]

---

[17] Joint Chiefs of Staff, Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01H, *Operation of the Joint Capabilities Integration and Development System* (Washington, DC: Joint Chiefs of Staff, 10 January 2012).

[18] NATO, *Military Committee Policy for Military Engineering*, MC 0560/1 (Final) (Military Engineering Center of Excellence (MILENG COE), 23 January 2012).

[19] Allied Joint Doctrine (AJP) 01(D), NATO Standardization Agency (NSA), December 2010, 6-3.

Mission creep: a gradual shift in objectives during the course of a military campaign, often resulting in an unplanned long-term commitment.

Non-Government Organization (NGO): NGOs typically fall into three broad categories: humanitarian relief, development, and United States Agency for International Development (USAID) implementing partners. Governmental participants in COIN will likely need to coordinate with NGO actors. Most NGOs will not allow their activities to be integrated with military plans, in order for NGOs to maintain impartiality and independence in their operations, acceptance for their role among the conflict-affected population, and the ability to operate securely.[20]

Provincial Reconstruction Team (PRT): A provincial reconstruction team (PRT) is an interim civil-military organization, designed to operate in semi permissive environments, usually following open hostilities. PRTs were established in Afghanistan at the end of 2002; they were integrated civilian-military organizations designed to meet three objectives: improve security, extend the reach of the Afghan government, and facilitate reconstruction in priority provinces. In keeping with the overall policy environment at the time, the central focus was on maintaining a light international security "footprint" and on building the capacity of Afghan institutions to address instability in remote, ungoverned regions.[21]

U.S. Army Command and General Staff College (CGSC): U.S. Army's college for professional Military Education. According to their homepage, The U.S. Army

[20] United States Army, Joint Publication 3-24, *Counterinsurgency*.

[21] USAID, Provincial Reconstruction Teams in Afghanistan, Interagency Assessment, June 2006, PN-ADG-252, accessed 14 May 2015, http://pdf.usaid.gov/pdf_docs/PNADG252.pdf, 8.

Command and General Staff College educates and trains and develops leaders for Unified Land Operations in a Joint, Interagency, Intergovernmental, and Multinational operational environment; and advances the art of science of the profession of arms in support of Army operational requirements.[22]

Limitations

There are currently three limitations that have been defined:

1. The research will primarily be limited to a NATO doctrine point of view. NATO doctrine is historically very influenced by U.S. doctrine, and therefore some relevant U.S. doctrine will be used as reference to develop the thesis.
2. This paper will consist of unclassified information only, and this will limit the sources used to write the paper.
3. This thesis will focus on doctrine, organization, training and leadership and education in the DOTML-PF analysis. The materiel, personnel and facilities factors in will not be focused on.

Scope and Delimitations

Because of the amount and the easy access to literature from Afghanistan, this conflict has been the main source when defining challenges in COIN operations. Literature from other operations and conflicts have been viewed, but not in the same depth. According to ADP 1 the Army, operational adaptability will drive changes across army doctrine, organization, training, materiel, leadership and education, personnel, and

[22] United States Army Combined Arms Center, "Command and General Staff College Mission," accessed 12 April 2015, http://usacac.army.mil/organizations/cace/cgsc/mission.

facilities (DOTMLPF). To compare COIN operations and hybrid war, a DOTML-PF analysis has been conducted. Due to the complexity of the topic, the comparison only focuses on the doctrine, organization, training, leadership and education factors.

Significance of Study

Jens Stoltenberg's first speech as NATO Secretary General was called "NATO: a unique Alliance with a clear course." The speech was held at the German Marshall Fund in Brussels, the 28th of October 2014, and made it clear that the number one priority for the NATO Alliance's 28 members is to deal with the threats from wherever they may come, whether they are conventional, unconventional, or hybrid threats. This provides all the 28 NATO members a clear guideline of the direction the alliance is heading, and the importance of understanding the threat scenario.

The operational environment of the future will be complex and challenging for the units defeating the threats. This study will give decision makers a better understanding of how to effectively use military engineer units. The study will also provide engineer commanders a better understanding of their role on the battlefields of tomorrow. When planning military involvement in the next conflict, it is important to verify the endstate by looking at previous conflicts.

CHAPTER 2

LITERATURE REVIEW

How will military engineering units contribute to the defeat of future threats in hybrid warfare?

Numerous studies and research papers have been conducted on the hybrid threat, in an attempt to predict the future and provide recommendations on how armed forces should prepare for the next conflict. This thesis will focus primarily on how the role of the military construction engineers will change when fighting the wars of tomorrow.

The literature in this thesis is being divided into three categories:

1. The first category includes engineer doctrine, organization, education and innovation before year 2000. The year 2000 has been chosen because NATO and the U.S. changed their focus when entering the conflicts in Afghanistan and Iraq.
2. The second category is literature describing the current situation. This category includes current U.S. and NATO doctrine, lessons identified from the last decade of COIN operations, and surveys from PRTs in Afghanistan.
3. The third category is literature that describes or predicts the future and how military engineers are supposed to face the threats of the Hybrid warfare. This category includes research papers addressing future threats, the Second Lebanon War.

In total these three categories will provide the foundation for the Functional Area Analysis in the Capability Based Analysis conducted later in this thesis. As the figure below illustrates, this thesis will present a historic crosswalk between doctrine,

organization, training and leadership, and education, before the year 2000, the current situation, and a predicted future.

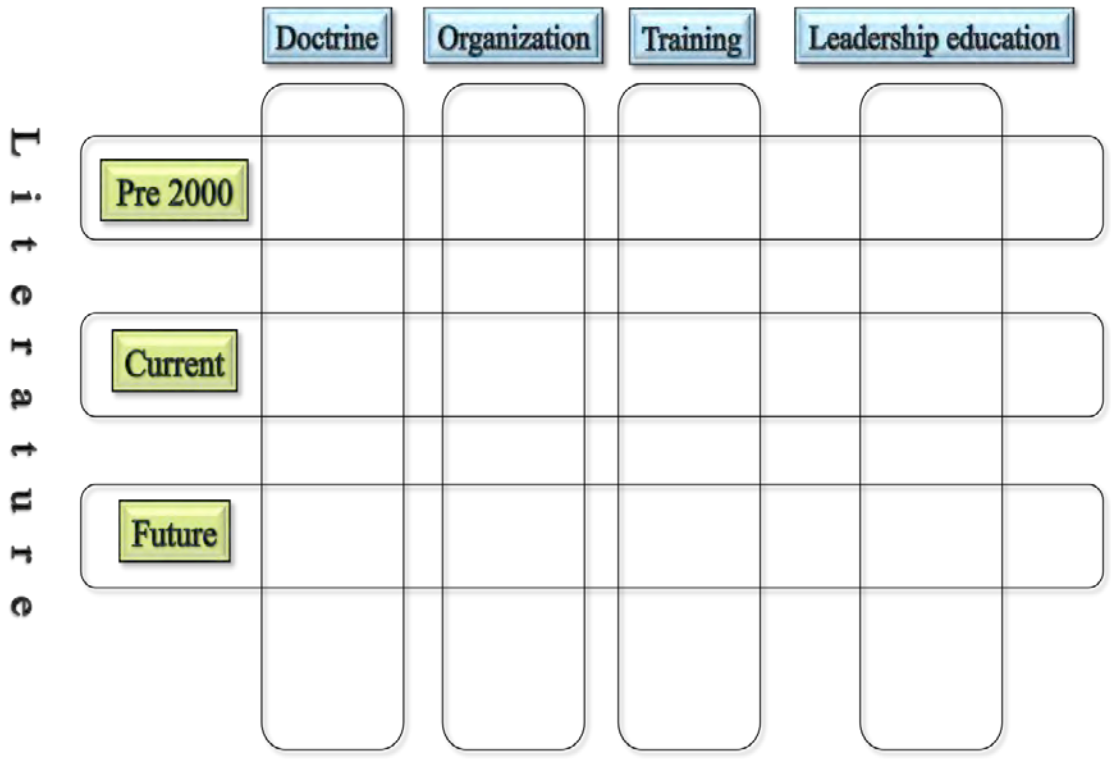

Figure 2. Literature Organization

Source: Created by author.

Military Engineering before Year 2000

The literature in this part has been chosen from different sources to create a deeper understanding of how and why changes took place in this time period. The literature varies from narrative history books to relevant NATO doctrine.

Building for Peace, U.S. Army Engineers in Europe 1945-1991, by Robert P. Grathwol and Donita M. Moorhus from 2005 describes the use of engineer units from the

end of World War II, until the collapse of Soviet Union in 1991. The book examines the engineers' construction activities in support of the U.S. and NATO forces. It also provides detailed information on how the role of the military engineers changed from post war reconstruction to construction and force protection. The book is relevant in describing the pre 2000 doctrine, organization and training. It describes innovation and changes within the military engineer branch, but it briefly touches on leadership and education.

U.S. Army Counterinsurgency and Contingency Operations Doctrine 1942-1976, by Andrew J. Birtle from 2006. This book examines the evolution of counterinsurgency and related doctrine in the U.S. Army. It also examines nation-building missions, obstacles inherent in dealing with such operations, and the strength and weaknesses of U.S. doctrine. Even though the book does not directly address engineers, it provides a greater understanding on how the COIN doctrine has developed over time. The book is relevant describing the leadership and education factor, but it is only from a U.S. perspective and does not address any additional challenges for NATO.

North Atlantic Treaty Organization, *The Alliances New Strategic Concept*, this unclassified document was developed and published in 1991.[23] The document describes NATO's role and responsibilities in a post Cold War environment. One of the greatest changes identified in this strategy was the introduction of NATO's potential role in peacekeeping operations. The 1991 strategy was the foundation for NATO peacekeeping operations within the Balkan region. The document also formed the foundation for the

[23] North Atlantic Treaty Organization, *The Alliances New Strategic Concept*, 7 November 1991, accessed 25 April 2015, www.nato.int/docu/comm/49-95/c911107a.htm.

later development of the 1999 Strategic Concept,[24] where non-Article 5 operations, and "out of-area" operations where introduced. These official documents are important for gaining a deeper understanding and providing a historic background for NATOs role in today's security environment. These strategies do not address the role of the construction engineers directly, but they do provide a foundation for implied construction engineer tasks.

Military Innovation in the Interwar Period, edited by Williamson Murray and Allan R. Millet from 1996. The book consists of ten comparative essays investigating the time between World War I and World War II, and how and why military innovation occurred or not. This book provides historic examples where nations and alliances had to develop and prepare their armed forces for the next war, based on recent experience and an uncertain future adversary. The interwar period differs from today's situation, like the level of technology and the presence of the information society. At the same time we see a number of similarities, like the fact that NATO forces have recent fighting experience, it is challenging to define an enemy, the armed forces are facing drawdowns, and NATO has identified that their military forces must be innovative, adaptive and agile to handle the future threats. Germany was in a similar situation between WW1 and WW2, but the German army was able to use their combat experience to develop an expedited doctrine and organization, consisting of well-trained soldiers and officers with the right education.

The book also provides reliable information concerning how the Germans were able to develop such a military organization. NATO and U.S. have both identified the

[24] The North Atlantic Treaty Organization, *The Alliances Strategic Concept*, 24 April 1999, accessed 25 April 2015, www.nato.int/docu/pr/1999/p99-065e.htm.

need for a flexible organization with innovative, agile and adaptive soldiers and officers, but they have not described how they will retain such competence when facing a drawdown. The German solution was to facilitate a bottom-up approach to information sharing, where lower level officers drove the process with their recent experience. This information is relevant when considering how to solve or mitigate the gaps in doctrine, training and in the leadership and education domains of the FAA.

Current Situation and Lessons Learned by the PRTs in Afghanistan and the IDF in the Second Lebanon War

To establish a situation understanding official U.S. and NATO doctrine has been used in this part. Research paper, surveys and books addressing lessons learned have been selected to provide an understanding of current operational environment.

Current role of the military engineers' is well described in Field Manuals (FM) and Joint Publications (JP). The FM 3-0 series is the most relevant and updated manuals to define the role of U.S. military engineers. The JP 3-34 Engineer Doctrine for Joint Operations provides a good understanding of how to plan joint engineer operations in most types of operation, but it does not provide guidelines on how to handle hybrid threats. The current versions of FMs and JPs describe and identify current capabilities in the FNA, and support all four of the domains that are being analyzed in this paper. The FMs and JPs are U.S. products but will still provide valuable information since NATO doctrine is so heavily influenced by U.S. doctrine.

Army Techniques Publication (ATP) No. 3.34.22, *Engineer Operations-Brigade Combat Team and Below*, December 2014. This is the updated U.S. doctrinal foundation for the conduct of engineer operations in support of unified land operations. This doctrine

suggests possible organization solutions, and also describes the differences between naval, air force and army engineers. Even though the doctrine does not address the hybrid threat, it describes a future more complex operational environment, which will be demanding for the engineer commanders.

The Norwegian Defense Research Establishment (FFI) has conducted eight surveys in cooperation with PRT Maimanah Afghanistan during the years from 2008 to 2014. One of the main tasks for the analysts was to carry out comprehensive progress assessments regularly. This includes both civilian and military issues. The survey provides data on how the situation is perceived by the local population during and after the Norwegian lead PRT was deployed to the area. The survey provides indicators on how the situation has improved for the host nation population in a PRT Area of Responsibility over time. It also indicates that even though the military endstate has been accomplished, the national endstate is far from accomplished. The survey does not provide any answers on how to solve COIN operations, nor how to meet the hybrid threat, but it provides data to identify and define the military problem in the FAA, and it also indicates possible capability gaps in the FNA. The doctrine and the organization domains are the two domains that the survey supports the most. Even though the survey does not address military engineers in specific, it identifies several potential engineer tasks. The report is relevant in defining the military problem, and will support the FAA. It also recommends ways the PRTs can be more effective in Afghanistan. These recommendations will also be relevant in other scenarios, and will therefore support the FSA.

Afghanistan Provincial Reconstruction Team Handbook, No. 11-16, February 11, is a collection of Observations, Insights and Lessons learned from former PRTs. The Center for Army Lessons Learned produced the handbook, and the intent of the book was to share knowledge, support discussion, and impart lessons and information in an expeditious manner. One of the lessons learned in the publication was the lack of building trade skills among the contractors. The handbook suggests using military engineers to train national army engineers on quality building trade practices appropriate for a developing country. Then the national army engineers can instruct the contractors.

This exemplifies what kind of capacities the engineers in the PRT have to possess. Mentoring of host nation organizations will still be relevant fighting the hybrid war. The handbook provides valuable guidelines for the organization, training and leadership, and education domains in the FAA, the FNA, and also experience based solutions from COIN operations in Afghanistan. The handbook does not provide specific information on how to face a hybrid adversary, and might have a limited value in the next conflict, since it is based on lessons from Afghanistan.

The NATO Standard Allied Joint Publication (AJP) 3.4.9, *Allied Joint Doctrine for Civil-Military Cooperation* from 2013 provides guidelines and directions for transition from offensive—defensive operations to security—stability operations for NATO forces. The publication does not specifically describe the hybrid threats or the engineer's role, but it is written based on lessons learned in Afghanistan and provides a good description of relevant challenges for the armed forces. The publication describes the relationship between military and external organizations. The AJP 3.4.9 is relevant in analyzing the organization, training, and leadership and education domains both the FAA

and the FNA. On the other hand, the doctrine does not provide depth concerning the moral dilemmas on the use of contractors in the theater.

The Allied Joint Publication AJP-3.12 Edition B Version 1, *Allied Joint Doctrine for Military Engineering* defines the role of the engineers in the NATO context. This doctrine was updated in June 2014 and is the doctrine that NATO might use fighting the next war. The doctrine describes the role of the military engineers fighting a conventional enemy. AJP-3.12 (B) does not address the hybrid threat, but it is valuable in identifying capability gaps in the other domains. The conclusions in this research paper might recommend changes or adjustment of the AJP 3.12 (B).

Military Capabilities for Hybrid War, Insight from the Israel Defense Forces in Lebanon and Gaza, by David E. Johnson. This is a research paper prepared for the United States Army, and it aims to assess recent irregular and hybrid conflicts and their implications for the U.S. Army force mix and capabilities. Johnson has also written a monograph that examines the Israelis' experiences in the Second Lebanon War and Operation Cast Lead. The monograph provides some possible explanations as to why IDF struggled fighting Hezbollah, and also which changes IDF made before Operation Cast Lead two years later. This paper provides relevant information describing the future threats, and is therefore relevant for the FAA. It also recommends changes in training, leadership and education in the FSA, but it is not directly aimed at military engineers.

Colonel Garland H. Williams's book *Engineering Peace* from 2005 is relevant to gain understanding of the military role in post conflict reconstruction. Williams uses historic examples from Bosnia, Kosovo, and Afghanistan. The author describes the challenging phase between the military and civilian operation. He proposes changes in

U.S. national security decision making to integrate a military engineering brigade into post conflict reconstruction, thus making U.S. military officials less wary of "mission creep" and nation building. Colonel Williams suggests several solutions on how to organize and use military engineers in host nation reconstruction. The book was written from a peace operation and COIN operation point of view. Colonel Williams' book does not address the additional challenges posed by a hybrid way of war fighting. The author describes the challenges facing the engineers when handing over the responsibility to civil contractors. He also provides valuable arguments for a military responsibility that expends further that just winning the battle.

The Hybrid War and Predicting Future Threats

Literature included in this part has been selected to develop a representative description of the future operational environment. This has been done in order to establish a broad understanding of the complexity of the hybrid war. Therefore this part focuses on the topic from a NATO, a Norwegian, a U.S. Army and a Chinese point of view.

NATO Countering the Hybrid Threat, by Michael Miklaucic, Director of Research and Editor of PRISM at the Center for Complex Operations at National Defense University. This report was developed based on an experiment called "Countering Hybrid Threats." The experiment was organized by NATO Allied Command Transformation, and included military and civilian counterparts from the transatlantic security community and nearly a hundred private sector professionals. The intent of the experiment was to test and examine the new NATO Strategic Concept. The Comprehensive approach is the concept that has evolved to encounter the multi dimensional nature of the hybrid threats.

It promotes the coordinated application of the full range of collective resources available including military, diplomatic, economic, intelligence, among others. This document is not military engineer specific, but it defines the hybrid threats, and it identifies several challenging areas relevant to military engineers. The most relevant areas are doctrine, organization, and indirectly training and leadership. In addition, the report provides capability gaps for military engineer units in the FNA.

Trends in Military Operations, was published by the Norwegian Defense Research Establishment in 2010, where hybrid threats were identified and analyzed. The report states that hybrid threats are nothing new, but the adversaries have adapted their use of assets to the western way of war. When the adversaries gain access to Western technology, it will turn around and use it as a weapon. The report also identifies the challenging fact that it seems hard to create coherence between tactics and strategy. In the past thirty years the U.S. and NATO have delivered some spectacular tactical wins, but these victories have not correspondingly led to lasting strategic gains in accordance with the initial objectives. The gaps identified in this report support the FAA and the conclusions in the report support identifying solutions within leadership and education in the FSA. The report is not engineer specific, but it describes the changes the IDF made based on experiences from The Second Lebanon War, and some of these changes are military engineer specific.

Military Capabilities for Hybrid War is a research paper, written by Dr. David E. Johnson, for the Department of the Army, and published by the RAND Corporation. The aim of the paper is to assess “irregular” and “hybrid” conflicts and their implication for the U.S. Army. The author uses experiences from the Israel Defense Forces (IDF) in

Lebanon and Gaza as the basis for his project. The paper defines the hybrid threat and provides some relevant implications for the U.S. joint force on how to fight a hybrid threat. The paper does not provide any information on how to create a stable and lasting solution on the conflict. This research paper will be relevant to identify capability gaps within current military engineer organization in the FNA.

Unrestricted Warfare is the title of a document published by two Chinese People's Liberation Army officers in 1999. The document states that weapons alone will no longer be sufficient to dominate the battlefield. The authors proclaim that the new principle of war is using all means, military and non-lethal, to compel the enemy to accept one's interest. This document provides a glimpse of the spectrum of means used in a hybrid war. It is relevant when identifying capability gaps between today's doctrine, organization, education and leadership, and the demands in the Hybrid war.

Headquarters, U.S. Army Training and Doctrine Command (TRADOC) is the proponent for the Training Circular (TC) 7-100 of November 2010. This publication describes the hybrid threats and summarizes the manner in which such future threats may operationally organize to fight U.S. forces. It also outlines the strategy, operations, tactics and organization of the hybrid threat that represents a composite of actual threat forces as an opposing force (OPFOR) for training exercises. The TC 7-100 provides examples on how a hybrid adversary would use its engineer assets in both defensive and offensive operations. Through its examples TC 7-100 indirectly provides guidelines on education areas and leadership challenges for a NATO engineer officer facing the hybrid threat.

Summary

To be able to answer the primary and secondary research questions, numerous books and research papers had to be studied, before finally selecting and structuring the most relevant literature. The selection was done, by focusing on the DOTLe factors in the analysis, and the time factors: before the year 2000, current situation and the predicted future. Intentionally literature from very different kind of sources has been chosen, to maintain bias. To establish credibility, all sources are open source and traceable.

CHAPTER 3

RESEARCH METHODOLOGY

How will military engineering units contribute to the defeat of future threats in hybrid warfare?

The previous chapter reviewed the pertinent literature and this chapter will provide the research methodology used in this project. Due to the information available and the nature of the primary and secondary questions, a case study research methodology has been chosen for this Master of Military Arts and Sciences paper. To assess the existing literature the analysis is being conducted in accordance with the Capabilities-Based Assessment (CBA) Process and the Joint Capabilities Integration Development System (JCIDS). This three-phased process is a well-known process suitable to develop capability documents. The CBA is not limited to a certain nation or organization, and will therefore be suitable for NATO as well. A research model has been developed to answer the primary and secondary research questions.

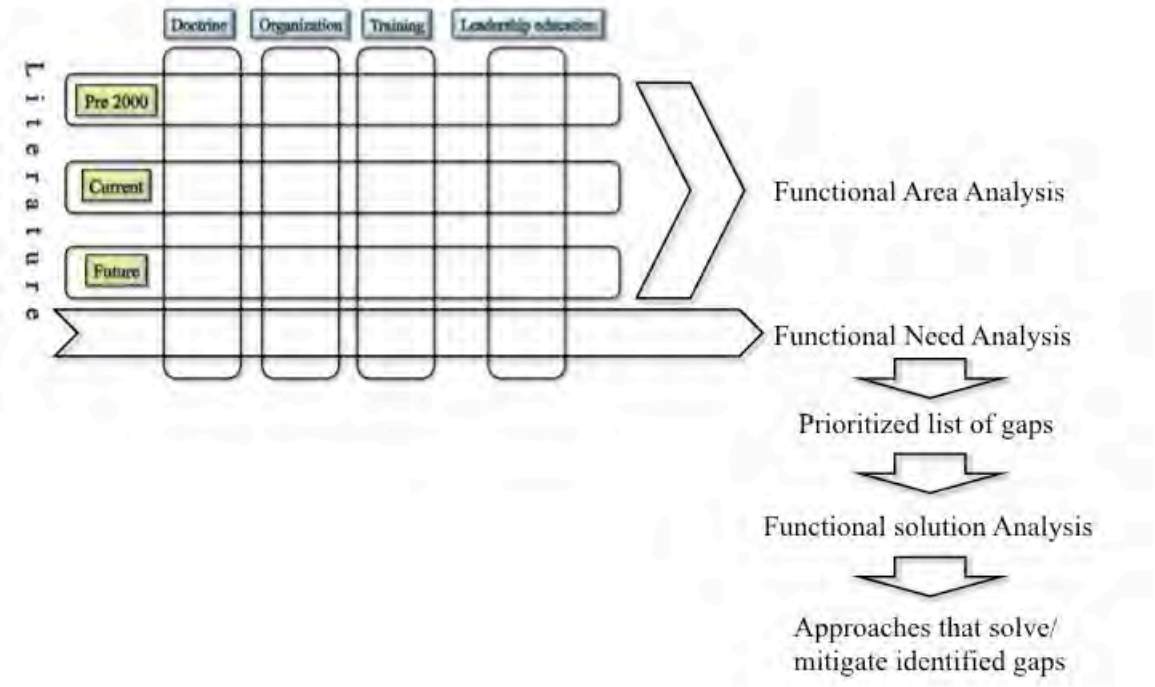

Figure 3. Research Model

Source: Created by author.

The first analytical phase of the process is the Functional Area Analysis (FAA), in this phase the military problem will be described. The purpose of this FAA is to identify current and future required capabilities and tasks. This, in order to execute military engineer operating and enabling concepts. It will also describe the conditions under which these tasks must be achieved. To describe these conditions a case study will be conducted on the lessons identified from the Second Lebanon War, recent experience in Afghanistan and on current operations in Ukraine. Inputs into this phase of the proses are the literature presented in chapter 2, and output will be a list of required capabilities with

their associated tasks, conditions, and standards. The analysis will be divided into the factors: doctrine, organization, training and leadership and education.

The second phase is the Functional Needs Analysis (FNA). The main purpose of this FNA is to identify and prioritize gaps in operational terms. The gap analysis is based on current capabilities and capability standards developed during the FAA. The output of this process is a prioritized list of gaps, which will impede future construction engineers from accomplishing their mission, if not addressed.

The third phase is the Functional Solution Analysis (FSA). The main purpose of the FSA is an analysis of the gaps from the FNA, and an identification of possible non-material solutions that cross the DOTL pillars, for the construction engineers. The output of this phase is a list of potential approaches that solve, or at least mitigate, one or more of the capability gaps. The CBA will then be used to support the simplified DOTML-PF analysis. The analysis will be engineer centric and will focus on the doctrine, organization, training, and the leadership and education (DOTL) domains.

CHAPTER 4

ANALYSIS

How will military engineering units contribute to the defeat of future threats in hybrid warfare?

The analysis is structured and sequenced according to the CBA assessment.

Functional Area Analysis

To be able to describe the current mission and the military problem, this section has been divided into the same three categories as in chapter 2. For a better understanding of today's situation, it is relevant to look to the past, and the way the roles of the military construction engineers have developed over time.

NATO Construction Engineers before the Year 2000

After Germany was defeated in World War II, Army engineers were faced with three essential tasks. First they had to handle redeployment of troops. Then they had to open ports on the North Sea, in order to move supplies to the troops, which included establishing, securing and maintaining Lines of Communication (LOC). Finally, they had to revitalize national civilian infrastructure in both liberated and occupied countries. This task also included taking care of the displaced persons in the area. To handle this situation, the U.S. Military employed 54,223 prisoners of war, many of whom were supervised by engineer troops to rebuild infrastructure. A central role of the construction engineers was to establish and maintain physical infrastructure that housed, protected,

trained, fed, armed, and diverted the soldiers of NATO and the U.S. in Europe.[25] As the European society became more developed, the chief engineer's office started contracting out projects, and competitive bidding by German contractors became the norm.

Because of the increased tension between the U.S. and the Soviet Union, the opinion of the German public became more and more important in American strategy. This change in strategy had significant impact on the role of the construction engineers. They were about to play a central role in fighting the Cold War, where the enemy was well defined, and its capacities well known. Simultaneously, the engineers had to contribute to the effort to win the population and support rebuilding Europe, in order to provide future allies to the U.S.

The North Atlantic Treaty Organization (NATO) was established in 1949, and marked that Europe needed the United States to counterbalance the power of the Soviet Union. The Cold War era focused on deterrence by nuclear weapons and conventional forces. Due to the changes in the threat picture, the European Command (EUCOM) had to reconsider its lines of communication and its logistical support, in order to protect against possible Soviet aggression. The changes in LOC resulted in more military construction for the Army engineers. The new situation forced NATO to convert to a credible defensive force, capable of driving back a Soviet attack. This reality resulted in an increase in troops deployed to Europe, and an increase in the need for infrastructure. Military construction engineers were responsible for the NIKE construction program, storage sites for atomic and chemical weapons and ammunition storage. In the beginning

[25] Robert P.Grathwol and Donita M. Moorhus, *Building for Peace, U.S. Army Engineers in Europe 1945-1991* (Washington, DC: Center of Military History and Corps of Engineers United States Army, 2005).

of the 1970s, Soviet Union deployed their SS-20 missiles and West Germany experienced several terrorist attacks. This led to the long-range security program, which was a design and construction program, to enhance the security of vulnerable infrastructure.

The U.S. Europe Division (EUD) was responsible for building of facilities to support new NATO missiles. EUD was faced with many country-to-country agreements, since each nation followed different rules and customs concerning contracting procedures, selection of materials, guarantees as well as the nature of the contract.

The major category of NATO funds supported the Common Infrastructure Program, which financed airfields, naval bases, headquarters, communication facilities, navigational aids, training facilities, ammunition storage, facilities for petroleum, oil, and lubricants, forward storage sites, reinforcement support, surface-to-air and surface-to-surface missile sites.[26]

"The basis of NATO's military planning must be to ensure security through credible deterrence; secondly, should aggression occur, to preserve or restore the integrity and security of the North Atlantic Treaty Area by employing such forces as may be necessary within the concept of forward defence."[27]

The NATO strategy and doctrine changed according to the current threat environment, and the role of the military engineers has changed accordingly. During the cold war the NATO doctrine focused on intelligence, deterrence through nuclear

[26] "Overview of USAREUR Real Estate Activities," I–A, III–E–13–1, VI–C–1. See also Memo, Camblor for LeTellier, 2 August 68, sub: Chronological History of Construction Responsibilities in France and Germany, EUD-RHA, Box M–2–4.

[27] Final Decision on MC 48/3 measures to implement the Strategic concept for the defense of the NATO area, 8 December 1969, accessed 14 May 2015, http://www.nato.int/docu/stratdoc/eng/a691208a.pdf.

capacities, and a counter offensive with conventional forces. This strategy led to a MILENG focus on establishing defensive positions, aircraft shelters, protected HQs, and facilities for an early warning system.

The engineers that conducted reconstruction in the immediate aftermath of World War II were organized in the same way they were during the war. Once the European nations had gained capacity, the military engineers took on a role as advisers, while local constructors executed the building. The adviser role also provided the engineers with new leadership challenges, because rank was no longer a power tool. The reconstruction of Germany was essential for a further development of Europe since Germany provided its neighboring countries with essential resources before the war. By comparing the economic, political and educational state in Germany in 1945 and in 1950 the nation building operation, conducted by The U.S. and the Allies, must be considered successful.

During the Cold War the element of surprise was believed to be essential, and therefore the NATO response was to establish one common standard and one way of operating and conducting training. General Blanchard, Commander of the Central Army Group, saw the need to promote the interoperability of military engineers of NATO countries operating in Europe's central region during the cold war. He initiated the founding of Euro NATO Training Engineer Center (ENTEC) in Germany in 1977 (now MILENG Center of Excellence).

The U.S, as the main contributor to NATO influenced the NATO doctrine throughout the Cold War, but they also contributed with military experiences from Vietnam and Korea. Within NATO the main focus was on The Warsaw Pact and the Soviet Union as the adversary. After 1989 NATO embraced a new strategic concept that

included peacekeeping and stabilization operations. This concept was tried out in the Balkans in the mid-1990s, and it was considered operationally successful.[28] During NATO peace operations in the Balkans the military engineers could only conduct operations that directly had an impact on the military mission. Reconstruction of infrastructure that had a civilian-use was outside of this mandate; it was a policy of non-nation building for military resources. Military engineers were allowed to repair MSRs and also some school buildings (on their own time).

Current Situation for the NATO Construction Engineers

The role of the construction engineers changed after 11 September 2001. When the Western world deployed its forces to Afghanistan, it was in order to hunt down and destroy insurgents like Al Qaeda and Taliban, not as peacemakers. The COIN operation in Afghanistan was not executed as a NATO operation, but as a U.S. led military coalition.

> The NATO focus has shifted from largely static collective territorial defence to expeditionary operations. Alliance forces must be ready to operate as part of a comprehensive military, political, economic and civil approach to complex, multi-dimensional challenges to enhance international security, through partnership with relevant countries and other international organizations. The Alliance will be capable of managing even the most challenging crises, and will be better able to work with other organizations and nations to promote international stability. NATO will become more agile, capable and efficient and will continue to be an essential instrument for peace. Amongst other things, Alliance Heads of State and Governments agreed on enhancing NATO's

[28] Astri Suhrke, "A Contradictory Mission? NATO from Stabilization to Combat in Afghanistan," *International Peacekeeping* 15, no. 2 (2008): 228.

> contribution to a comprehensive approach to crisis management, stabilization and reconstruction.[29]

The concept also describes how the current and future security environment consists of conventional threats but numerous unconventional threats dominate.

The NATO "Military Committee Policy for Military Engineering," MC 0560/1 (Final), 23 January 2012, states that NATO will enhance its contribution to a comprehensive approach to crisis management, stabilization and reconstruction. Depending on the operation, its phases and the operational environment, the most likely MILENG focus at the tactical level for all components will be mobility support balanced with provision of life support and development of infrastructure.[30] Multinational MILENG capabilities must be tailored to the mission; ideally, they should be mobile, flexible, and modular.[31]

Another key NATO document impacting engineer operations is the NATO Standard AJP-3.12, *Allied Joint Doctrine for Military Engineering*, Edition B Version 1 June 2014. According to recent experiences there are rarely enough military engineers available, and this shortage may be partially overcome by the use of civilian construction and service contractors. AJP 3-12 specifies that MILENG will support and coordinate the project management execution of all infrastructure projects in accordance with the infrastructure development plan, and also may be required to contribute to multinational

---

[29] NATO, *Strategic Concept for the Defense and Security of the Members of the North Atlantic Treaty Organization*, November 2010, accessed 14 May 2015, http://www.nato.int/cps/en/natolive/official_texts_68580.htm, 10.

[30] NATO, *Military Committee Policy for Military Engineering*, MC 0560/1, 6.

[31] Ibid., 4.

training of joint force units, NGO and IO personnel and local population. MILENG will also provide advice on appropriate physical protective measures, including obstacles, observation points, warning (detection) systems, camouflage, and mitigation of weapon effects on structures.

Current U.S. doctrine Joint Publication 3-34, *Joint Engineer Operations* describes engineer support throughout the range of military operations:

> Major operations and campaigns frequently require ground combat (or the possibility of ground combat), as do crisis response and contingency operations. Such operations will require engineers who can integrate their activities with the fires and maneuver of ground combat forces to assure the mobility of friendly forces, alter the mobility of adversaries, and enhance the protection of friendly forces. Some activities require engineer capabilities as an inherent part of a mission to provide support outside the joint force. Engineer support is inherent in the tasks of stability operations to restore or provide essential services, such as water, power, and transportation, and to repair critical infrastructure.[32]

The ability to safeguard national interests and maintain national sovereignty still rests on a military capability of robust and balanced military forces. Land war plays a central role in all forms of self-defense and deterrence.

According to the updated ATP 3-34.22, through augmentation of specialized personnel and equipment, the capabilities of construction companies can be expanded significantly. The doctrine prescribes that they must be prepared to face future adversaries that are adaptive and have a wide array of capabilities that allow them to successfully fight a more technologically superior force.[33]

---

[32] Joint Chiefs of Staff, Joint Publication (JP) 3-34, *Joint Engineer Operations* (Washington, DC: Joint Chiefs of Staff, 2011), 9.

[33] United States Army, Army Techniques Publication (ATP) 3-34.22, *Engineer Operations-Brigade Combat Team and Below* (Washington, DC: Department of the Army, December 2014).

According to the newly revised NATO CIMIC doctrine, the 21st Century strategic environment will involve a myriad of ethnic, religious, ideological and capability drivers. This reality will require sustainable solutions in societies ravaged by conflicts, disasters or humanitarian catastrophes. Military means alone will not be sufficient to solve these challenges. Civil-military cooperation enables the military to reach its endstate by coordinating, synchronizing and de-conflicting activities with civil contributors, thus linking military operations with political objectives. The doctrine identifies infrastructure development and environmental protection as particular engineer areas of expertise in support of CIMIC.[34] For such a relationship to be productive it has to be based on trust, respect, patience and tact, as well as determination to collaborate with all actors, military and civilian. One of the activities that NATO is likely to support is restoration of essential services, in order to provide support to those in need, and to cement the support of the civil population. Engineer tasks in such an operation can be re-establishment of transport systems, provision of potable water, electrical power and other utilities.[35]

Other relevant doctrine references include the Non-Article 5 Crisis Response Operations (NA5CRO) (AJP-3.4 (A)) and the U.S. Joint Doctrine for Military Operations Other Than War (MOOTW) (JP 3-07). NATO Engineer forces will contribute significantly to mission success within these scenarios, especially during humanitarian and disaster relief operations.

When conducting COIN operations, the fight for the support of the people has been important. The insurgents depend on support and sponsorship from the population

[34] North Atlantic Treaty Organization, Allied Joint Publication (AJP) 3.4.9.

[35] Ibid., 26.

to be effective. The armed forces depend on the same support to end the insurgency, and to develop a lasting safe and secure environment. Since construction engineers have the capacity to conduct infrastructure development that will benefit the civil society, engineers have played a central role in winning the hearts and minds of the local population. The PRTs that have been deployed throughout Afghanistan have all contributed to reconstruction and development of local infrastructure. However, how they contributed and their effectiveness is difficult to assess. National differences between the Troop Contributing Countries (TCC) have influenced the way the PRTs have solved their mission, and the role of the military construction engineers. The civil military cooperation challenge was also solved differently according to national and cultural differences, on both the military side, but also on the civil organization side.

According to Colonel Garland H. Williams a success criterion for the reconstruction operation and a lasting peace, is that the reconstruction begins immediately upon the cessation of hostilities.[36] At the time the military construction engineers are the only capable assets available in the theatre. If the reconstruction phase is being delayed, it will be more challenging to gain the support from the population.

Future Situation for NATO Construction Engineers

A broad number of challenges face NATO, as the Bi-Strategic Command Input to a new NATO Capstone Concept for the Military Contribution to Countering Hybrid Threats noted in August 2010. The rapid increase of new communications technologies,

[36] Colonel Garland H. Williams, *Engineering Peace, The Military Role in Postconflict Reconstruction* (Washington, DC: United States Institute of Peace Press, 2005), 31.

globalization, and the expansion of global transportation networks, has minimized the significance of geographical and political boundaries. Because of these facts, the NATO Bi-Strategic Command has assessed Hybrid threats as one of the most challenging problems of the post-Cold War era.[37] Hybrid threats will seek to exploit gaps in both the broader security environment and within NATO's security policy across the entire spectrum of conflict. NATO has focused on common force training and integration of doctrines prior to actual operations. The inherent operational weakness of alliances and coalitions has been improved by the development of large national units, integrated ideally at operational level, but traditionally not lower than brigade level. This has been done in order to lessen the amount of friction that tactical integration carries with it, and to reduce the number of areas vulnerable to multinational differences.[38]

Multinational operations demand a broader range of leadership skills than previously required by military commanders.[39] Since the Cold War, multi nationality occurs farther down in the chain of command, making leadership even more challenging. Military construction engineers, down to the tactical level, need competence to work in a multinational environment. This means that an engineer commander must be able to build

---

[37] NATO, *Bi-SC Input to a New NATO Capstone Concept for the Military Contribution to Countering Hybrid Threats*, 25 August 2010, accessed 14 May 2015, http://www.act.nato.int/the-countering-hybrid-threats-concept-development-experiment, 3.

[38] Steve Bowman, *Historical and Cultural Influences on Coalition Operations*, quoted in Thomas J. Marshall, Phillip Kaiser, and Jon Kessmeier, *Problems and Solutions in Future Coalition Operations* (Carlisle, PA: Strategic Studies Institute, 1997), 18.

[39] J. R. MacIsaac, "Leadership During Peace Support Operations: 'Mission Impossible'" (Paper, Canadian Forces College, Kingston, Ontario, 2000).

an effective team, consisting of personnel from different cultures, with varying abilities and agendas. The present international security environment also involves working with many non-traditional participants or partners, including members of other forces, organizations, and civilians (MacIsaac 2000).

Recent experiences from ISAF operation in Afghanistan have proven this point. The cooperation level between NATO and UN varied significantly from 2003 to 2011. There is evidence that persistent differences in NATO's and the UN's organizational norms regarding impartiality and the use of force complicated their cooperation.[40]

Construction engineers possess capacities that are desirable for both the armed forces and the civil organizations; therefore, the engineer commanders must have thorough understanding of the strategy and endstate of the mission. Military construction engineers have the potential to bridge the gap between the armed forces and the NGOs, but they also have the potential to severely damage the possibilities for NGOs to be successful. NGOs impartiality was one of the main reasons why Norway developed the "Norwegian model" for the PRT in Maimana in the Faryab province. The Norwegian model was developed throughout the period and the Norwegian government published a guiding document in 2009.[41] The approach had the twin aims of improving the coordination between civilian and military efforts, while at the same time distinguishing clearly between the sectors. The Norwegian Armed Forces tried to handle the challenges

[40] Michael F. Harsch, *The Power of Dependence, NATO-UN Cooperation in Crisis Management* (London: Oxford University Press, 2015).

[41] Norwegian Government, 4; Norwegian Ministry of Foreign Affairs (UD) Norwegian MoD (FD), Norwegian Ministry of Justice and the Police (JD), *A Strategy for Comprehensive Norwegian Civilian and Military Efforts in Faryab* (Oslo, 2009), 3.

concerning the civil-military cooperation. Therefore, the Norwegian PRT did not directly participate in reconstruction operations.

Norway was the lead nation of the PRT from 2005 until 2012, and the main goal in the strategy was to support the Afghan government in their effort to ensure stability, security and development. The strategy also emphasized that the Norwegian effort should be based on Afghan values. The Norwegian model left the difficult work of reconstruction to the more capable NGOs. Separating the development actors from those providing security became a challenge as the security situation in the Pashto areas worsened. Development was most needed where the security situation was the worst. Because of the risk, the NGOs ended up concentrating their efforts in the Uzbek areas.[42] ISAF focused on increasing the support of the elected government in challenging areas, which was the opposite of what the Norwegian model led to. The Norwegian Ministry of Foreign Affairs eventually pulled out its lead representatives from the Norwegian PRT, and let the NGOs operate independently. The model functioned in a safe setting, but when confronted with the challenges of multi- functionality and multi-agency in a complex conflict, the model appeared less adequate.

The Norwegian Defense Research Establishment (FFI) conducted eight extensive surveys to analyze the value of the effort conducted by the PRT. The first survey, conducted in 2010, identified unemployment and lack of electricity as the biggest problems. The last survey was conducted in 2013, one year after the redeployment of the PRT, and it identified unemployment and lack of electricity, in addition to poverty and

[42] Rune Solberg, Lt Col Norwegian Army, *Development Gone Astray [Bistand på ville veier], Aftenposten* (Oslo: Schibsted, December 2010), accessed 14 May 2015, http://www.aftenposten.no/meninger/kronikker/Bistand-pa-ville-veier-6274301.html.

lack of water to be the biggest problems. The local population perceived the security in the area to have increased throughout the period. The Norwegian PRT did not have organic construction engineer assets within their organization, since they were not supposed to conduct construction operations. The PRT was supposed to facilitate for such operations to take place. Another survey conducted in the area stated that the population had a positive view of the Norwegian PRT. The respondents specially focused on the positive interaction of the Norwegians with communities, the absence of casualties, and the amount of investment.[43] The study also identified an additional challenge caused by the impression of a "peace penalty," where troublemakers were rewarded and peaceful areas were punished, by receiving fewer resources.

In 2008 ISAF had deployed twenty-six PRTs in Afghanistan, smaller and medium sized NATO countries operated twelve of these.[44] Every country also deployed a national command structure to support the national troops, which led to a possible intervention in the NATO chain of command. In addition to these challenges, troops could also be detached with restrictions in use or national caveats. These challenges will also be present the next time engineers participate in a multi national coalition force.

The Second Lebanon War provides additional insight in hybrid warfare and the possible challenges for construction engineers. The superior Israeli Defense force (IDF) struggled facing Hezbollah's hybrid warfare. As a non-state actor Hezbollah, led by Hassan Nassruallah, demonstrated state-like military capabilities, like intermediate-range

[43] Geert Gompelmann, "Winning Hearts and Minds? Examining the Relationship between Aid and Security in Afghanistan's Faryab Province" (Feinstein International Center, Tufts University, 2010).

[44] ISAF, ISAF troops in numbers.

rockets and missiles. Hezbollah used a mixture of guerrilla tactics and technology in densely populated urban centers.[45] They exploited the urban terrain and used construction assets to build strong defensive fortifications in close proximity of noncombatants.[46] Construction assets were also used to complicate Israeli targeting, by using underground facilities to store weapons, conduct operations, and launch rockets. In addition, they also constructed decoy firing positions for deception.

Hezbollah conducted an information operation throughout the conflict, where they published every Israeli loss internally; simultaneously they published the Israelis destruction of civil targets and collateral damage to the world press. By the use of Internet, the target population for their information operation ended up being the population with Internet access. The result of their information operation was that they gained the support from the outside world. Hezbollah was also able to hack into the Israeli Defense Force's computer systems prior to the invasion.[47] IDF expected guerrilla tactics, but met a conventional antitank and obstacle focused defense force (Much like NATO trained its static collective territorial defense until 1990). Hezbollah had established strongholds and antitank defense positions in villages and prepared strongholds. They operated out of fortified positions, supported by bunkers, trenches, minefields and IEDs.

---

[45] Frank G. Hoffman, *Conflict in the 21st Century: The Rise of the Hybrid Wars* (Arlington, VA: Potomac Institute for Policy Studies, December 2007), 36.

[46] Andrew Exum, *Hizballah at War: A Military Assessment* (Washington, DC: Washington Institute for Near East Policy, December 2006), 9-11.

[47] United States Joint Force Command, *Irregular Adversaries and Hybrid Threats: An Assessment* (Fort Leavenworth, KS: Joint Irregular Warfare Center, 2011).

It is believed that external actors with military equipment and capacities had supported Hezbollah, but were only around 3000 soldiers defending against a technological superior force of 30,000. At the conclusion of the war, Hezbollah's construction unit immediately began documenting losses, clearing rubble, rebuilding houses (Christian and Muslim), schools and infrastructure. This happened before the promised aid from the Western governments could be delivered.[48] The way Hezbollah took the reconstruction initiative provides a template for how fast a post conflict reconstruction operation must take place.

After the war several investigations were initiated, many of them by the Israelis themselves. The final report of the Israeli investigation into the Lebanon War in 2006 covered actions at the end of the war. The report, named the Winograd Commission Report, was released on 30 January 2008, and an English summary were published by *The New York Times* the same day. The report states that the 2nd Lebanon War was a serious missed opportunity. It also proclaimed that a semi-military organization was able to resist the strongest army in the Middle East, which had full air superiority and technology advantages. The Winograd report found severe "failings and flaws in the defense of the civilian population and in coping with it being attacked by rockets."[49]

One of the most important consequences of the report was that training became a strategic priority. The new Minister of Defense Ehud Barak and the Chief of General

---

[48] Helena Cobban, "The 33-Day War, Hizbullah's Victory, Israel's Choice," November 2006, accessed 25 April 2015, http://www.bostonreview.net/cobban-33-day-war.

[49] New York Times, "English Summary of the Winograd Commission Report," 30 January 2008, accessed 10 March 2015, http://www.nytimes.com/2008/01/30/world/middleeast/31winograd-web.html.

Staff Gabi Ashkenazi, who were both Veterans, initiated this change. The training focused on basic and individual skills, at squad and platoon level. Tank units were trained in conventional offensive operations, and artillery units were trained in speed and accuracy. Infantry focused their training on operations in populated areas, with engineers providing mobility and force protection. Eventually the IDF conducted combined exercises with air support. Three years later when IDF were up against Hamas in what has been known as the Operation Cast Lead, they had learned some lessons from the 2nd Lebanon War. The major changes done by IDF were focusing training on combined arms, and moving the commanders out of the HQs and closer to the units. In addition, the IDF used engineers in armored Bulldozers to establish their own axis of advance, and added armor on the main battle tanks for increased protection.

These two conflicts in the Middle East have several similarities, but many more differences. Hamas does not have the same capabilities as Hezbollah, and the terrain in southern Lebanon is different from the terrain in the Gaza Strip. It is still relevant to look at how IDF used recent experience from a hybrid conflict, to improve its own doctrine, organization, training, and leadership and education.

An additional source that predicts the complexity of the future conflict is the book Unrestricted Warfare. It was written by two Chinese colonels, and proposes tactics for developing countries to use faced with a larger and technological superior enemy. The preferred tactics is to use all means necessary. The authors state that:

> This kind of warfare means that all means will be in readiness, that information will be omnipresent, and the battlefield will be everywhere. It means that all weapons and technology can be superimposed at will, it means that all the boundaries lying between the two worlds of war and non-war, of military and non-military, will be totally destroyed, and it also means that many of the current

> principles of combat will be modified, and even that the rules of war may need to be rewritten.[50]

The Russian Federation's annexation of Crimea provides NATO with a template of the warfare of tomorrow. Russia uses development of local infrastructure on the peninsula as a tool to remove focus from the fact that they have invaded another country. The effect has so far proven very beneficial for Russia. One year after Crimea was annexed; the majority of the local population in Crimea seems to support Russia.[51] NATO and the rest of the world have forgotten that Putin invaded another country, the size of Maryland with a population of 2.4 million, and claimed it to be Russian territory.[52] The hybrid war tends to erase the borders between peace and war, and between combat and noncombat.

These examples describe the complex and challenging environment in which NATO Construction Engineers must be capable to operate. According to these cases, the hybrid environment does provide insight in a more complex environment, like the Second Lebanon War where Hezbollah combined trenches and guided missiles. The access to technology and the rapid changes on the battlefield will cause operational changes. General engineers have adjusted their capabilities from focusing on the conventional

---

[50] Qiao Liang and Wang Xiangsui, *Unrestricted Warfare* (Beijing: Chinese People's Liberation Army Literature and Arts Publishing House, 1999).

[51] John O'Loughlin and Gerard Toal, "The Crimean Conundrum," 3 March 2015, accessed 10 March 2015, https://www.opendemocracy.net/od-russia/john-o'loughlin-gerard-toal/crimean-conundrum.

[52] Michel Casey, "The Crime of the Century, A Year after Claiming Crimea for Russia, Putin Appears to have gotten away with the Heist," *New Republic*, 4 March 2015, accessed 10 March 2015, http://www.newrepublic.com/article/121222/one-year-after-russias-annexation-world-has-forgotten-crimea.

battlefield to now focusing on supporting the armed forces in a COIN environment. This change has been going on since the end of the Cold War, so the Army Universal Task List (AUTL) continues to add construction related tasks. The construction engineers have also played an important role in coordinating, or at least facilitating for, post conflict reconstruction. This means that the end state of the military construction efforts is the start point for the civil organizations. What follows is a list of capabilities with associated tasks that has been developed by using the cases described, the AUTL, and the requirements identified by State Department's Office of the Coordinator for Reconstruction and Stabilization (S/CRS) to support countries in transition from armed conflict or civil strife to sustaining stability.

Table 1. NATO Construction Engineers Reconstruction and Stabilization Capability and Task List

CAPABILITIES	TASKS
Support the movement and maneuver Warfighting function in a hybrid environment.	MOVEMENT AND MANEUVER WARFIGHTING FUNCTION
	Conduct Mobilization of Tactical Units
	Conduct Tactical Deployment and Redeployment Activities
	Conduct Tactical Road March
	Conduct Tactical Convoy
	Conduct Assured Mobility
	Enhance Movement and Maneuver
	Construct Combat Roads and Trails
	Construct Forward Airfields and Landing Zones
	Conduct Movement support to Gap Crossings, Breaching, and Passage of Lines
	Conduct Countermobility Operations
	Site Obstacles

	Construct, Emplace, or Detonate Obstacles
	Mark, Report, and Record Obstacles
	Maintain Obstacle Integration
Support the Sustainment Warfighting function in a hybrid environment.	THE SUSTAINMENT WARFIGHTING FUNCTION
	Provide General Engineering Support
	Develop Infrastructure
	Restore damaged Areas
	Provide Facilities Support
	Provide Waste Management
	Provide Engineer Support to Bases and Installtions
	Enable Logistics
	Construct Roads and Highways
	Construct Over-the-shore Facilities
	Construct Ports
	Construct Railroad Facilities
	Construct Airfield Facilities
	Construct Petroleum Distrubution Systems
	Construct Bridges
	Produce Construction Materials
	Provide Technical Engineer Support
	Provide Engineer Survey Support
	Perform Quality Assurance and Surveillance Operations
	Supply Mobile Electric Power
Conduct Mission Command through pushing authority down to lower levels.	CONDUCT MISSION COMMAND
	Conduct the Operations Process
	Plan Operations
	Prepare for Tactical Operations
	Execute Tactical Operations
	Assess Tactical Situations and Operations
	Conduct Knowledge Management and Information Management
	Facilitate Situational Understanding Through Knowledge Management
	Manage Information and Data
Through cooperation with non-military actors, establish unity of effort.	*Conduct Civil-Military Operations*
	Provide Interface or Liaison Among Military and Civilian Organizations
	Locate and Identify Population Centers

	Identify Local Resources, Facilities, and Support
	Conduct Negotiations with and Between Other Government Agencies and Nongovernmental Organizations
	Conduct Civil Affairs Operations
	Conduct Civil-Military Operations Center Operations
	Assess condition of existing facilities that are integral for effectively implementing other post-conflict sector essential tasks
	Plan Civil Affairs Operations and Civil-Military Operations
	Execute Command Programs
	Preserve Historical Documentation and Artifacts
Integrate IO in construction operations.	*Integrate Inform and Influence Activities*
	Support Information Operations
Establish infrastrucure that fasilitates information security.	*Information Protection*
	Provide Information Assurance
	Perform Computer Network Defense
	Perform Electronic Protection Actions
	Conduct Electronic Protection
Protect modern critical infrastructure from threats.	THE PROTECTION WARFIGHTING FUNCTION
	Perform Fratricide Avoidance
	Detect and Establish Positive Identification of Friend, Foe, and Noncombatants
	Maintain Constant Situational Awareness
	Conduct Operational Area Security
	Conduct Area and Base Security Operations
	Conduct Critical Installations and Facilities Security
	Protect natural resources
	Establish Local Security
	Conduct Response Force Operations
	Secure Supply Routes and Convoys
	Apply Antiterrorism Measures
	Identify Potential Terrorist Threats and Other Threat Activities
	Reduce Vulnerabilities to Terrorist Acts and Attacks
	React to a Terrorist Incident

By taking advatage of modern technology and experience, reducing the risk of own forces.	*Enhance Protection*
	Protect Against Enemy Hazards in the Area of Operations
	Protect Individuals and System
	Prepare Fighting Positions
	Prepare Protective Positions
	Employ Protective Equipment
	Provide Fire and Emergency Services
	Disperse Tactical Forces
	Conduct Security Operations
	Conduct Actions to Control Pollution and Hazardous Materials
	Conduct Chemical, Biological, Radiological, and Nuclear Operations
	Support Weapons of Mass Destruction Proliferation Prevention
	Conduct Chemical, Biological, Radiological, and Nuclear Defense
	Implement Operations Security
	Conduct Operations Security
	Implement Physical Security Procedures
	Counter the Threat
	Conduct Logistics Security Operations
Adjust own organization and operational behaviour according to current threat level in area of operation. Utilize media to communicate development operations and construction engineers contributions.	FULL SPECTRUM OPERATIONS, TACTICAL MISSION TASKS, AND OPERATIONAL THEMES
	Conduct Offensive Operations
	Conduct Defensive Operations
	Conduct Stability Operations
	Create indigenous capacity to protect critical infrastructure
	Secure military depots, equipment, ammunition dumps and means of communication
	Create indigenous capacity to protect military infrastructure
	Create indigenous capacity to protect contractor and NGO stabilization personnel and resources
	Provide conventional military assistance programs

	Establish military-to-military programs with the host country's forces
	Establish demobilization camps
	Develop integrated command, control and intelligence (C2I) and information sharing arrangements between international military, constabulary and security forces
	Develop coordinated military and civilian C2I and information sharing arrangements
	Utilize media as public information tool
	Fasilitate Economic development
	Design initiatives to provide immediate employment, soliciting projects ideas from local communities
	Assess skills deficiencies
	Assess and determine immediately employable labor force for appropriate critical and emergency needs
	Organize and mobilize local and foreign assistance necessary to initiate training and development of vital skills
	Conduct Civil Support Operations
	Provide Support in Response to Disaster or Terrorist Attack
	Provide Support to Civil Law Enforcement
	Provide Other Support as Required
	Train and indigenous construction forces
	Identify, rehabilitate, secure, and maintain basic facilities to enable delivery of essential local services
	Evaluate water sources to meet needs and protect against contamination
	Construct water treatment and distribution facilities
	Establish basic facilities to enable functionality for host nation government
	Conduct Military Engagements
	Conduct Limited Interventions
	Conduct Peace Operations
	Conduct Irregular Warfare

Source: Created by author.

Functional Need Analysis

NATO construction Engineers have frequently been deployed to multinational operations since the Cold War, and have gained a lot of experience and competence in the last twenty years. Now when NATO members are redeploying their forces from Afghanistan and Iraq, often facing a reduction of force, they face the challenge of retaining this competence. Several NATO members are not financially able to keep up with de rapidly developing threats, and they are forced to prioritize their recourses. It is likely that multinational forces will compose NATO construction engineer units in the future. During the last years NATO has developed and updated most of their engineer doctrine. On the strategic level, the MC 0560/1 was updated in 2012. The AJP 3.12 (B) is from 2014, and covers the operational level, and on tactical level, the ATP 3.12.1 is currently being updated. The doctrine for civil-military cooperation is from 2013, and the doctrine addressing Non-Article 5 operations is under revision. NATO has also initiated several conferences addressing the hybrid threat. In 2011 the organization furthermore also conducted an experiment called “Countering Hybrid Threats.”

The FAA does not present the need for any new capabilities for the military construction engineers, but it describes an environment where the construction engineers have to be capable of focusing on numerous capabilities simultaneously, and be capable to solve challenges with new partners, a new process, and by a new way of thinking. This will have an impact on how NATO prepares their construction engineers for the hybrid war.

The gaps identified in the FAA, have been prioritized according to the following criteria, consequence for NATO, consequence for NATO construction engineers and how

challenging it will be to mitigate the gap. Every factor has been given a value between one and five. One means little consequence or very challenging to mitigate, and five means sever consequence or easy to mitigate. This has been done to identify which gap has the most severe consequence and at the same time easiest to mitigate.

Table 2. Prioritization of Gaps				
Capability Description	**Consequence for NATO**	**Consequence for NATO construction engineers**	**Challenging to mitigate gap**	**Total**
	Still being a relevant and capabel security organization	*Continue to be a relevant actor for the commander and a bridgebuilding capacity towards the non-military actors*	*How simply can the gap be mitigated*	
Linking the tactical and the strategically level by conducting construction and developing efforts.	5	4	3	12
Cooperate with non-military actors, and maintain their impartiality.	4	3	4	11
Flexibel organization and C2.	3	4	3	10
Rapid escalation and deascelation on lower level.	3	4	3	10
Effective communication within a multinational NATO engineer construction unit.	4	4	2	10
React to incidents.	3	2	3	8
Mission command through, decentralized execution and actual authority to make decisions on the lower level.	2	3	2	7
Prevent conflict.	2	2	3	7
Assessing and managing risk to critical infrastructure.	2	3	2	7
Relearn construction engineer competence in support of the maneuver commander.	2	3	1	6

Source: Created by author.

Following is a list of prioritized capability gaps based on the FNA, and the criteria used in table 2.

Table 3. List of Prioritized Capability Gaps

Priority	**Capability Description**	**Capability Standards**	**Gap**	**When will the gap occur**	**Impact of gap on CONOPS**
		The standard the Construction Engineer must achieve	*How the existing capability fail to meet the standard*	*Identify whether the gap exists, is expected to occur, when?*	*Impact if not eliminated*
1	Linking the tactical level and the strategically level by conducting construction and developing efforts.	Support the maneuver force with construction efforts, while maintaining focused on the strategically endstate.	The military endstate is not aligned with the national endstate, and not synchronized with the diplomatic, information and economic efforts.	The gap currently exists.	The construction efforts will not support the strategic endstate, and resources will be wasted.
2	Cooperate with non-military actors, and maintain their impartiality.	NATO Construction engineers must be able to establish an effective relationship with non-military actors.	Cultural differences, willingness, lack of competence, no functional organizational solution established.	The gap currently exists, and will occur when civil and military development and reconstruction assets participate in the hybrid operational environment.	The reconstruction efforts will be ineffective because of missing unity of effort.

3	Flexible organization and C2.	Capable of cooping with the high tempo of multiple hybrid threats.	An operational command and control design with a hierarchical decision-making process.	The gap currently exists.	Ineffective in countering hybrid threats in a realistic timescale.
4	Rapid escalation and de-escalation on lower level.	Construction engineer units must be capable of securing themselves.	The military skill level among construction engineers among NATO members varies.	The gap currently exists.	Risk of own force.
5	Effective communication within a multinational NATO engineer construction unit.	Language proficiency for construction engineers according to NATO STANAG 6001 (SLP 3-3-3-3 LSRW).	The language proficiency test does not measure technical vocabulary language proficiency.	Joint Analysis and Lessons Learned Centre (JALLC), identified gap in 2010.	Misunderstanding and hampered information flow on tactical level, and reduced tempo.
6	React to incidents.	Multi functional construction engineer unit must be capable of rapid deployment.	The current NATO Reaction Force, has limited construction capabilities.	The gap exists in current NATO Force.	Construction engineers are being deployed to late with insufficient capabilities.
7	Mission command through, decentralized execution and actual authority to make decisions on the lower level.	Leaders on lower levels must be given authority to make decisions in accordance with the commander's intent.	National political guidelines interfere with the military operation down to small unit level.	The gap exists in the current chain of command structure.	Construction engineers will loose their flexibility, and tempo.

8	Prevent conflict.	Conduct construction and development operations prior to conflict, in order to reduce tension.	Construction engineers are generally deployed too late and with not sufficient capabilities to prevent escalation.	Expected to occur when the next conflict escalates.	The conflict is more likely to escalate.
9	Assessing and managing risk to critical infrastructure.	Maintain essential capacities in a populated and technologicall y complex environment, in all phases of a hybrid conflict.	The last decades of COIN operations has been conducted in an under-developed and rural area.	During a military operation conducted in a developed and population dense environment.	Loose momentum in the nation building process, loose support from the host nation population, and delay the initiation of the reconstruction phase.
10	Relearn construction engineer competence.	Establish protected infrastructure capable of withstanding both conventional and unconventiona l attacks.	The infrastructure developed during the cold war has been neglected, or demolished, and fortification competence has not been a focus area.	The nature of the hybrid war proves the need for prepared positions on NATOs border again.	NATO population will suffer unnecessary in an initial attack, and the armed forces will lose the initiative.

Source: Created by author.

Functional Solution Analysis

Doctrine

Current NATO doctrine is the MC 0560/1 on the strategic level, the AJP 3.12 (B) on the operational level, and the ATP 3.12.1 on the tactical level. The AJP 3-4-9 is the

NATO doctrine for CIMIC operations, and the AJP 3-4 (A) is addressing operations other than article 5 operations. This doctrine addresses or at least relates to the threats from the hybrid war. None of the doctrines addresses the possibility of how to use construction engineers in a pre-conflict construction function. The NATO CIMIC doctrine is up to date, but it does not fully address the challenge with national differences within NATO members. This is relevant when establishing a relationship with NGOs and other external actors that will influence the battlefield of the hybrid war. For NATO to be capable and relevant in the hybrid war, it will be essential to also have the capacity to take advantage of non-military assets.

Different NATO members have established different procedures. JALLC should work to identify these different approaches and their effect.

New doctrine and procedures concerning the relationship between NATO, EU, UN, NGOs, GOs and IGs should be developed, based on the results from the JALLC reports. This could provide a partial solution to the gap. If so, the AJP 3-4-9 has to be updated.

Organization

North Atlantic Treaty Organization construction engineers are currently not organized to integrate or cooperate with non-NATO entities. The range of threats in the hybrid war may force NATO construction engineers to change the way they are organized, to better facilitate cooperation with non-traditional actors. Current NATO organization also has a hierarchical decision making process which reduces tempo, and removes authority from the lower level. The organization has challenges concerning interoperability due to differences in command and control equipment.

A gap is occurring between military construction engineers and NGOs. Another gap has also been identified within NATO's organization, since different troop contribution countries (TCC) have different preferences on how to organize their engineer units in order to address the issues with civil and military cooperation.

The North Atlantic Treaty Organization is a military defense organization, and therefore has no authority over NGO's they meet on the hybrid battlefield. NATO construction engineers do have the people, the equipment, and the resources to deal with this gap, but they are not in a position to predict how the NGOs are being organized. To mitigate these gaps an agreement or a memorandum of understanding has to be established between civil and military development capacities.

North Atlantic Treaty Organization members have been reducing their military budgets, and different nations have different priorities within their armed forces. Because of this, NATO must rely on multi national task forces organizations to solve the complex hybrid war.

The North Atlantic Treaty Organization's ability to adapt to the future threat environment will determine if the organization will maintain its role as a relevant defense alliance. The construction engineers are a key actor with the potential of bridging the gap between military and non-military actors. NATO has to become an organization that facilitates flexibility and innovation. It also has to establish an organization culture that tolerates risk and supports experimenting.

Training

The military construction engineers must be more capable of developing effective teams consisting of both military and nonmilitary elements. Construction engineers must

able to link tactical construction efforts with level strategically endstates and purposes by work efforts on the operational level. These gaps are partly caused by inadequate training with NGOs and other untraditional non-military actors. It is a result of the complexity of the hybrid war. The hybrid war will be challenging and resource demanding to train. The relevance and value of training depends on participation from different nations and non-military actors, the scenario has to be complex and the equipment has to be interoperable. Tempo and unpredictability will be present in the hybrid war; some of this training should therefore be conducted without warning, and under pressure.

Military construction engineers have to train in a complex environment where their ability to be creative and innovative determines their success or failure. Military construction engineers could participate in internship programs with relevant NGOs. NGOs should participate in military exercises, with a maneuver focus, to gain their understanding of the military contribution in the different phases in a conflict.

New training programs for newly recruited personnel can mitigate some of the gaps. This personnel category has the advantage of not being exposed to traditional military solutions. Because of this they will bring new and different points of views, but they have to be proved by recent experience.

Leadership and Education

The hybrid war will challenge the construction officers and their leadership skills. They must be skillful engineers with relevant competence, but also adaptive, flexible warriors with team builder competence and the ability to motivate, coach, and mentor external and internal actors. Simultaneously they must be able to maintain focused on accomplishing the mission even in extreme situations. It will be important to

recruit/retain personnel with the adequate potential to function as a leader, but also a technical engineer in the hybrid war. When these people have been identified, they must be provided adequate education to function in their primary role. Officers and NCOs with the required potential, that are currently serving, must be retained and given assignments where they can contribute the most. To establish a better relationship between and non-military actors both sides needs better understanding of each other. Since many of NATO TCCs are now facing a drawdown, an internship program with NGOs should be established. By establishing such a program the construction engineers would gain competence, and also bring a valuable point of view to the non-military organization.

Since the complexity of the battlefields of tomorrow will increase, interoperability among NATO members will be even more important. Today, different members have different military culture, and opinions. This could be a strength in the hybrid war since differences in point of views can provide valuable and creative solutions to old competence gaps. Identified gaps concerning assessing and managing risk to critical infrastructure, can be mitigated by directed education of key personnel. However, due to the technological rapid development, this is an area, which becomes more and more complex, and needs to be continuously maintained. The results of decades of COIN operations has led to a neglect of basic construction engineer functions, like for instance gap crossing, fortification, camouflage, and deception operations. These classes have to be reintegrated into the engineer curriculums.

Another focus area for leadership and education of construction engineers within NATO is the challenge of language skills. NATO engineers from the 28 different countries must be able to communicate effectively. This means both technical language

skills, but also interoperable command and control assets. In addition to the military units the hybrid operational environment will consist of nonmilitary actors. All these actors must be able to effectively communicate and operate.

The U.S. is by far the biggest contributor to NATO, the U.S. Army Command General Staff College (CGSC) at Fort Leavenworth does not have NATO doctrine on its curriculum. Furthermore, the Combined Arms Research Library (CARL) U.S. Army at Fort Leavenworth is not allowed to store or maintain any NATO materials. Before CARL Library can carry NATO material, a NATO User Agency or Control Point has to be established for their organization.

Updates and changes to the leadership and education process will help resolve some of the issues identified. Since task organization will take place on a low level (Company level), the leaders at this level needs to have developed a suitable skillset to be effective. NATO should develop a doctrine for small unit leaders, similar to what The United States Marine Corps has done. To support the *Marine Corps Vision and Strategy 2025*, a Small Unit Decision Making (SUDM) Workshop was conducted in January 2011.[53] The purpose was to "improve the ability of small unit leaders across the MAGTF to improve their ability to assess, decide, and act while operating in a more decentralized manner."[54]

[53] United States Marine Corps, *U.S. Marine Corp. Small Unit Decision Making (SUDM)* (US Marine Corps Training and Education Command, August 2011).

[54] Ibid., 40.

Summary

The FAA provided the capabilities and tasks for the NATO construction engineers in the hybrid war. By comparing the outcome of the FAA with current capabilities in the FNA, it shows that NATO construction engineers, between World War II and now, has been capable of facing the hybrid threats. The challenge is that they have never had all the capacities simultaneously. To be capable in the hybrid war a nation or an organization must be able to apply and combine all the tools in the "toolbox." Current NATO doctrine is updated, and addresses the hybrid war, but current organization is not well enough prepared. The training level of construction units is inadequate to face the hybrid threats, and leadership and education must reintegrate basic engineer skills. It is likely that for a military defense organization to be successful in the hybrid war, it must be able to fully take advantage of the non-military capacities.

The CGSC does not include NATO doctrine in their curriculum, even though it is been communicated that fighting as a member of an alliance, is the preferred way to fight. The hybrid war will be demanding and challenging for NATO officers. They must be able to maintain focus during a rapid by changing environment, with an untraditional organization. Task organization will have to take place on a low level, in order to face the challenges. This will challenge the leaders on this level.

The North Atlantic Treaty Organization has not established a doctrine for small unit construction leaders. Instead of inventing something new, it might be a good idea to look at the U.S. Marine Corps. The U.S. Marine Corps, both Air and Ground forces, has dedicated construction units. In addition the Navy has the Construction Battalions (CBs), now known as SEABEES. They are rapidly deployable combat construction engineers,

and capable of constructing bases, airfields, and landing strips, as well as handle uncertainty. These are all necessary skills for the NATO construction engineer.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The purpose of this research paper was to assess the NATO construction engineers' role in the future hybrid war. The primary research question asked how military construction engineer units would contribute to the defeat of future threats in hybrid warfare. The answer to that question is, like they have always done, with construction, sustainment and survivability operations, but they must be capable of doing this in a more complex environment.

Secondary research questions:

1. How will the hybrid threat change current NATO doctrine for Construction Engineers?

Existing NATO doctrine are updated and are addressing the hybrid threats. NATO CIMIC doctrine provides valuable guidelines for establishing the important relationship between military and civil actors, but does not fully address the complexity of the future operational environment expected in the hybrid war. The NATO Military Committee has identified that NATO engineers must be interoperable, mobile, flexible, modular and capable, but simultaneously TCC's are reducing their forces. The Committee is describing a situation where the NATO military construction engineers are supposed to do more with less. Concerning the increased complexity in the hybrid war, these factors must be taken into consideration when furthering developing the doctrine on the operational (AJP 3-12) and on the tactical level.

2. How will the hybrid threat affect changes in the Army Construction Engineers organization?

The construction engineers must be organized in a way where they have the capacity to include external actors, and also flexible enough to adjust the organization according to factors like: situation, mission, changes in threat level, and available resources. By looking at the range of potential missions, the rapid changes in the operational environment, the size of the battlefield and available C2 assets, the construction engineers must be organized to facilitate mission command. It will be crucial for NATO to establish and organize a capable, multinational construction engineer task force to face the future challenges.

3. How will the hybrid threat change training of Army Construction Engineers?

The construction engineers must be capable of supporting the maneuver commander, constructing modern protective infrastructure and winning hearts and minds simultaneously, in the same operational environment. For a unit to possess such capabilities it must have been prepared through thorough and realistic training. NATO engineers must train with each other and other potential battlefield actors. This training should be done often enough to establish a relationship based on trust and understanding between the organizations. Only by sufficient training can NATO be prepared for the hybrid war.

4. How will the hybrid threat impact leadership and education of Army Construction Engineers?

Due to the complexity of the hybrid war, and the way a future construction engineer unit might be organized, leadership will be challenging. To handle the rapid

changes and the uncertainty in the operational environment the leadership must be based on mission command. To deal with the different organizations, competences, cultures and missions personal power will be more important than positional power for the leader. To be a successful leader of a NATO construction engineer unit in the hybrid war it will, the leader must be a developing leader with teambuilding competence.

To develop the flexibility needed to fight the hybrid war the construction engineer units must be interoperable. To be interoperable the military, engineer and leadership education among the NATO members should be coordinated closer, this could have been the responsibility of MILENG COE in Ingolstadt in Germany. They could also have the responsibility to certify military engineer units.

Recommendations

When more information is available, an analysis on how Russia deployed and used their construction units on the Crimea Peninsula and in Eastern Ukraine is recommended. This conflict might prove to be a very relevant case study for NATO construction engineers. It templates the use of construction engineers early in the operation phase, in combination with humanitarian assets, an offensive information campaign, and Special Forces. NATO construction engineers must be able to contribute to the offensive, defensive, and the stability phase of the hybrid war, by the use of traditional means but also by the use of new capabilities.

This thesis has been limited in focus to doctrine, organization, training and leadership and education in the DOTML-PF analysis. Therefore, an additional study should be conducted on the materiel, personnel and facility factors, to identify gaps and solutions among these factors as well.

Another recommendation is to analyze The U.S. Marine Corps' approach to small unit leadership. This might be relevant for future development of doctrine for NATO construction engineers.

The final recommendation, and probably the most important one, is to conduct research on how NATO, as a multinational defense organization, can be relevant in the Hybrid war. This thesis indicates that to fight the hybrid war, a force needs to be capable of fighting with every means possible. If this is true then NATO needs to develop capacities outside of the solely military. NATO should be able to deploy with a complete toolbox and not as a tool.

> He who fails to plan is planning to fail.
>
> Attributed to — Sir. Winston Leonard Spencer Churchill,
> Prime Minister of the United Kingdom
> during World War II

BIBLIOGRAPHY

Allied Commander Transformation. “Information Brochure.” Accessed 12 April 2015. www.act.nato.int.

Betz, David. “Redesigning Land Forces for Wars Amongst the People.” Essay, Old Dominion University, 2008.

Birtle, Andrew J. *U.S. Army Counterinsurgency and Contingency Operations Doctrine 1942-1976.* Washington, DC: Center of Military History United States Army, 2006.

Bolger, Daniel P. *Why We Lost: A General’s Inside Account of the Iraq and Afghanistan Wars.* New York: Houghton Mifflin Harcourt, 2014.

Casey, Michel. “The Crime of the Century, A Year after Claiming Crimea for Russia, Putin Appears to have gotten away with the Heist.” *New Republic*, 4 March 2015. Accessed 10 March 2015. http://www.newrepublic.com/article/121222/one-year-after-russias-annexation-world-has-forgotten-crimea.

Center for Army Lessons Learned. No. 11-16, *Afghanistan Provincial Reconstruction Team Handbook*. Fort Leavenworth, KS: Center for Army Lessons Learned, 2011.

Cobban, Helena. “The 33-Day War, Hizbullah’s Victory, Israel’s Choice.” November 2006. Accessed 25 April 2015. http://www.bostonreview.net/cobban-33-day-war.

Daltveit, Egil, Jan Frederik Geiner, and Palle Ydstebø. “Trends in Military Operations.” (FFI)-report 2010/00692. Norwegian Defense Research Establishment. 26 April 2010. Accessed 14 May 2015. http://www.ffi.no/no/Rapporter/10-00692.pdf.

Echevarria II, Dr (Lt Col.) Antulio J. *Toward an American Way of War*. Carlisle, PA: Strategic Studies Institute, March 2004.

Exum, Andrew. *Hizballah at War: A Military Assessment*. Washington, DC: Washington Institute for Near East Policy, December 2006.

French, Julian. “Time to Face Reality: The World’s Rapidly Shifting Military Balance.” *Daily Journal*. Accessed 14 May 2015. http://thedailyjournalist.com/thethinker/time-to-face-reality-the-world-s-rapidly-shifting-military-balance/.

Gabrielse, Robert. “A 3D Approach to Security and Development.” Partnership for Peace Consortium (PfPC) of Defense Academies and Security Studies Institutes, Garmisch-Pertenkirchen, Germany, 2008.

Galula, David *Counterinsurgency Warfare: Theory and Practice.* New York: Praeger Publishers, 2006.

Gompelmann, Geert. “Winning Hearts and Minds? Examining the Relationship between Aid and Security in Afghanistan’s Faryab Province.” Feinstein International Center, Tufts University, 2010.

Government Accountability Office. GAO-10-1036R, *Hybrid Warfare*. Washington, DC: Government Accountability Office, 2010.

Grathwol, Robert P., and Donita M. Moorhus. *Building for Peace U.S. Army Engineers in Europe 1945-1991*. Washington, DC: Center of Military History and Corps. Of Engineers, United States Army, 2005.

Harsch, Michael F. *The Power of Dependence, NATO-UN Cooperation in Crisis Management*. London: Oxford University Press, 2015.

Hoffman, Frank G. *Conflict in the 21st Century: The Rise of the Hybrid Wars*. Arlington, VA: Potomac Institute for Policy Studies, December 2007.

Johnson, David E. *Military Capabilities for Hybrid War, Insight from the Israel Defense Forces in Lebanon and Gaza.* Santa Monica, CA: RAND Corporation, 2010.

Joint Chiefs of Staff. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01H, *Operation of the Joint Capabilities Integration and Development System*. Washington, DC: Joint Chiefs of Staff, 10 January 2012.

———. Joint Publication (JP) 3-24, *Counterinsurgency*. Washington, DC: Joint Chiefs of Staff, 2013.

Kilcullen, David. *The Accidental Guerrilla: Fighting Small Wars in the Midst of a Big One*. New York: Oxford University Press, 2009.

MacIsaac, J. R. “Leadership During Peace Support Operations: ‘Mission Impossible’.” Paper, Canadian Forces College, Kingston, Ontario, 2000.

Marshall, Thomas J., Phillip Kaiser, and Jon Kessmeier. *Problems and Solutions in Future Coalition Operations*. Carlisle, PA: Strategic Studies Institute, 1997.

Marthinussen, Elin, David Nordli, and Bard Eggereide. Faryab Survey wave 8–a year after the redeployment of Norwegian forces from Faryab. (FFI)-report 2014/00064, Norwegian Defence Research Establishment, 24 January 2014. Accessed 14 May 2015. http://www.ffi.no/no/Rapporter/14-00064.pdf.

Mattis, Lt Gen James N., and Lt Col (R) Frank Hoffman. “Future Warfare: The Rise of the Hybrid Wars.” *Proceedings* (November 2005): 1-2.

Miklaucic, Michael. “NATO Countering the Hybrid Threat.” 2011. Accessed 29 April 2015. http://www.act.nato.int/nato-countering-the-hybrid-threat.

Moore, Scott R. *Reexamining Complex Operations*. Washington, DC: Center for Complex Operations, 2009.

Murray, Williamson, and Allan R. Millet. *Military Innovation in the Interwar Period*. Cambridge University Press, 1996.

Murray, Williamson, and Peter R. Mansoor, eds. *Hybrid Warfare: Fighting Complex Opponents from the Ancient World to the Present*. New York: Cambridge University Press, 2012.

NATO. *Bi-SC Input to a New NATO Capstone Concept for the Military Contribution to Countering Hybrid Threats*. 25 August 2010. Accessed 14 May 2015. http://www.act.nato.int/the-countering-hybrid-threats-concept-development-experiment.

———. *Military Committee Policy for Military Engineering*, MC 0560/1 (Final). Military Engineering Center of Excellence (MILENG COE), 23 January 2012.

———. *Strategic Concept for the Defense and Security of the Members of the North Atlantic Treaty Organization*. November 2010. Accessed 14 May 2015. http://www.nato.int/cps/en/natolive/official_texts_68580.htm.

New York Times. “English Summary of the Winograd Commission Report.” 30 January 2008. Accessed 10 March 2015. http://www.nytimes.com/2008/01/30/world/middleeast/31winograd-web.html.

North Atlantic Treaty Organization. Allied Joint Publication (AJP) 3.4.9, *Allied Joint Doctrine for Civil-Military Cooperation.* NATO Standardization Agency (NSA), 8 February 2013. Accessed 14 May 2015. http://www.cimic-coe.org/wp-content/uploads/2014/06/AJP-3.4.9-EDA-V1-E1.pdf.

———. Allied Joint Publication AJP-3.12, *Allied Joint Doctrine for Military Engineering*, Edition B, Version 1. North Atlantic Treaty Organization, Military Engineering Center of Excellence (MILENG COE), 2014.

———. *The Alliances New Strategic Concept.* 7 November 1991. Accessed 25 April 2015. www.nato.int/docu/comm/49-95/c911107a.htm.

———. *The Alliances Strategic Concept*. 24 April 1999. Accessed 25 April 2015. www.nato.int/docu/pr/1999/p99-065e.htm.

Norwegian Ministry of Foreign Affairs (UD) Norwegian MoD (FD), Norwegian Ministry of Justice and the Police (JD). *A Strategy for Comprehensive Norwegian Civilian and Military Efforts in Faryab*. Oslo, 2009.

O'Loughlin, John, and Gerard Toal. "The Crimean Conundrum." 3 March 2015. Accessed 10 March 2015. https://www.opendemocracy.net/od-russia/john-o'loughlin-gerard-toal/crimean-conundrum.

Qiao Liang, and Wang Xiangsui. *Unrestricted Warfare*. Beijing: Chinese People's Liberation Army Literature and Arts Publishing House, 1999.

Report of the International Commission on Intervention and State Sovereignty (ICISS). *The Responsibility to Protect*, December 2001, paragraph. 5.1. Accessed 15 May 2015. http://responsibilitytoprotect.org/ICISS%20Report.pdf.

Report of the UN High-level Panel on Threats. *Challenges, and Change, A More Secure World: Our Shared Responsibility*, 2004. paragraphs 201-203. Accessed 14 May 2015. http://www.un.org/en/peacebuilding/pdf/historical/hlp_more_secure_world.pdf.

Solberg, Rune, Lt Col Norwegian Army. *Development Gone Astray [Bistand på ville veier]*. *Aftenposten*. Oslo: Schibsted, December 2010. Accessed 14 May 2015. http://www.aftenposten.no/meninger/kronikker/Bistand-pa-ville-veier-6274301.html.

Stahn, Carsten. "Responsibility to Protect: Political Rhetoric or Emerging Legal Norm?" *The American Journal of International Law* 101, no. 1 (January 2007): 120.

Suhrke, Astri. "A Contradictory Mission? NATO from Stabilization to Combat in Afghanistan." *International Peacekeeping* 15, no. 2 (2008): 214-236.

The Norwegian Government. *A Strategy for Comprehensive Norwegian Civilian and Military efforts in Faryab Province, Afghanistan.* Ministry of Foreign Affairs, Ministry of Defence and Ministry of Justice and the Police-May 2009. Accessed 14 May 2015. https://www.regjeringen.no/globalassets/upload/fd/dokumenter/strategy_norway-in-faryab-afghanistan.pdf.

The UN Secretary-General. *In Larger Freedom, Towards Development, Security and Human Rights for All*, paragraph 135. 21 March 2005. Accessed 14 May 2015. http://www.un.org/en/ga/search/view_doc.asp?symbol=A/59/2005.

———. *The Rule of Law and Transitional Justice in Conflict and Post-conflict Societies*, paragraph 2. 23 August 2004. Accessed 14 May 2015. http://www.unrol.org/files/2004%20report.pdf.

UN General Assembly. Resolution adopted by the General Assembly. *60/1. 2005 World Summit Outcome*, GA Res 60/1, 60th Sess. A/RES/60/1. 24 October 2005. Accessed 14 May 2015. http://www.ifrc.org/docs/idrl/I520EN.pdf.

United States Army Combined Arms Center. “Command and General Staff College Mission.” Accessed 12 April 2015. http://usacac.army.mil/organizations/cace/cgsc/mission.

United States Army Combined Arms Center. *Afghanistan Provincial Reconstruction Team Handbook. No. 11-16.* Fort Leavenworth, KS: Center for Army Lessons Learned, February 2011.

United States Army. Army Doctrine Publication (ADP) 3-0, *Unified Land Operations*. Washington, DC: Department of the Army, October 2011.

———. Army Doctrine Reference Publication (ADRP) 3-90, *Offense and Defense*. Washington, DC: Department of the Army, August 2012.

———. Army Techniques Publication (ATP) 3-34.22, *Engineer Operations-Brigade Combat Team and Below*. Washington, D: Department of the Army, December 2014.

———. Field Manual (FM) 3-24/MCWP 3-33.5, *Counterinsurgency*. Washington, DC: Government Printing Office, 2006.

———. Field Manual (FM) 5-71-100, *Division Engineer Combat Operations.* Washington, DC: Government Printing Office, 1993.

United States Department of the Navy. Navy Marine Corps (NAVMC) Manual No. 2890, *United States Marine Corps Small Wars Manual*. Reprint, Washington, DC: U.S. Marine Corps, 1940.

United States Joint Force Command. *Irregular Adversaries and Hybrid Threats: An Assessment*. Fort Leavenworth, KS: Joint Irregular Warfare Center, 2011.

United States Marine Corps. *U.S. Marine Corp. Small Unit Decision Making (SUDM).* US Marine Corps Training and Education Command, August 2011.

U.S. Army Training and Doctrine Command (TRADOC). Training Circular (TC) 7-100, *Hybrid Threat*. Fort Eustis, VA: TRADOC, 2010.

USAID. Provincial Reconstruction Teams in Afghanistan, Interagency Assessment. June 2006. PN-ADG-252. Accessed 14 May 2015. http://pdf.usaid.gov/pdf_docs/PNADG252.pdf.

Walzer, Michael. *Just and Unjust Wars.* New York: Basic Books, 1977.

Williams, Colonel Garland H. *Engineering Peace, The Military Role in Post Conflict Reconstruction*. Washington, DC: Endowment of the United States Institute of Peace, 2005.